THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. V. No 107—7th YEAR.] LONDON, NOVEMBER 25, 1856. [Subscription per Ann. { 15s. in Advance / 18s. Credit.] Price 8d. Unstamped.

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Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.
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CHARLES BOTTEN and SON, having lately exchanged some STATION-METERS (in good condition) for larger ones, will dispose of them on most reasonable terms. C. B. and SON would also call the attention of all buyers to their new tariff for Consumers' Meters. CHARLES BOTTEN and SON, Engineers and Manufacturers of Gas Meters, Fittings, and all Gas Apparatus, Crawford Passage, Ray Street, Clerkenwell, LONDON.

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Nov. 22, 1856.

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WANTED, by the Londonderry GASLIGHT COMPANY, a Person qualified to act as METER INSPECTOR and SUPERINTENDENT of STREET MAINS. He must be versed in the Construction and Repairing of Gas-meters, and will be required to do General Repairs in the Works. Salary, £70 per annum. Applications (in applicant's handwriting), accompanied with copies of Testimonials of character and efficiency, to be addressed to Mr. HENRY RIDLEY, Manager, Gas-works, LONDONDERRY, on or before the 9th of December next.
Londonderry Gas-works, Nov. 12, 1856.

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NEWCASTLE-ON-TYNE,
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Thirty years RETORT SETTER to some of the leading London and Provincial Gas Companies, to whom he can refer, begs leave to draw attention to his economical mode of Setting Clay or Iron Retorts, &c.
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Manufacturers of every size and description of Wrought-iron Tubes and Fittings, from one-eighth up to seven-inch internal diameter, for Gas, Steam, or Water.
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for Marine, Locomotive, and Stationary Boilers.
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In Iron or Gun Metal, from three-eighths to six-inch bore. Manufacturers of every description of hand-screwing
STOCKS, DIES, AND TAPS,
for Gasfitters and Engineering purposes.
Manufacturers of Coils, for hot water and other purposes; Casing of all sizes, with flush joints, for Well-sinkers; Blasting Tubes; Buffer Tubes for Railway Carriages; Tubes for Roller Beams; Spindles, Shafts, Pendulums, Hydraulic Presses, Core Bars, Steam Gauges, &c. &c.
JAMES RUSSELL and SONS beg to call the attention of Engineers, Builders, Water Companies, and others, to their
PATENT ENAMELLED TUBES,
which preserve water or other liquids conveyed by them in a perfectly limpid condition; whilst the Enamel itself is as pure as the finest Porcelain, possessing the rare recommendation of being entirely free from any noxious ingredient in its composition.
Lists, Estimates, &c. &c., forwarded on application; orders, from 10 to 100,000 feet of gas tube, executed at twelve hours' notice if required; and quality may be safely relied upon, as all goods are most carefully tested before leaving the Works.
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"Office: No. 6, Charing-cross, London, April 6, 1854.
"Gentlemen,—I have much pleasure in informing you that the Jury has awarded to your firm 'HONOURABLE MENTION FOR LAP-WELDED IRON TUBES.' You are at full liberty, if you deem it likely to promote your mercantile advantage, to affix to these articles, during the season 1854, a card whereon this Award is printed, and also your prices, with name of agent, &c.—I am, gentlemen, your obedient servant,
"JOHN H. BOHN, Secretary.
"Messrs. JAMES RUSSELL and SONS, Wednesbury, STAFFORDSHIRE."

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THE Directors of the Great Yarmouth GASLIGHT and COKE COMPANY are prepared to receive TENDERS, accompanied with Plan and Specification, for the erection of a NEW CAST-IRON TANK, 67 feet diameter and 16 feet deep, with not less than 8 Cast-iron Columns, &c.; and also for a GASHOLDER to work in the same. The whole to be of the best materials and proper strength, and complete in every respect in construction. The Contractor will be required to give a guarantee to have the whole completed and ready for use by the 1st day of August next.

All the necessary scaffolding, &c., to be found by the Contractor at his own expense.

Persons desirous of contracting for the above are requested to send sealed Tenders (stating the separate price of Gasholder and Tank, and also what will be the price if the Directors should determine on increasing the size to 20 feet deep), and addressed to the Directors of the Great Yarmouth Gaslight and Coke Company; and to be sent to, or delivered at, the Company's Office, King Street, Great Yarmouth, on or before the 1st day of December next.

The Directors do not bind themselves to accept the lowest or any Tender.

Further particulars may be obtained on application to WM. H. WILLIS, Superintendent, Gas-works, GREAT YARMOUTH.

Dated Oct. 21, 1856.

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GAS-METER MANUFACTURERS,

14, BARGE YARD CHAMBERS, BUCKLERSBURY,

LONDON,

AND 131, BRADFORD STREET, BIRMINGHAM,

beg to submit to Gas Companies and others some of the advantages possessed by their

PATENT ANTI-CORROSIVE ECCENTRIC GAS METER

over those of the ordinary kind.

The Case is formed of strong Sheet Iron of the best quality by powerful machinery; and, when complete, consists of

FIVE PIECES ONLY,

(the ordinary case contains Twenty-five pieces), which is thickly coated, with a Metallic Alloy, similar to that of the Drum, which renders it as durable as the Drum itself.

The SYPHON, or Spout, is cast in one body, without seam, and is double the thickness of those usually employed.

The parts that communicate Motion to the Index are INDESTRUCTIBLE, and will continue in good working order for an indefinite period.

The FLOAT is cylindrical, and not liable to collapse.

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The INDEX is thoroughly protected from water rising in the Spindle Tube, should the pressure exceed six inches.

The FILLING and WATER-LEVEL APPARATUS are on the Syphon principle, which prevents the abstraction of Water from the Meter by pressure.

These, with other minor improvements, make this Meter superior in every respect to those generally made.

The Patentees respectfully solicit a trial, feeling confident that its advantages only require to be known to ensure its general adoption. The original principle, so long tried and proved to be correct, has not been departed from in the arrangement of the PATENT METER—the aim of the Patentees having been to perfect what has been already well tested, rather than risk any novel combination or untried invention.

Knight, Merry, and Exley also manufacture the ordinary Wet Gas-Meter, Street Lamps, &c. &c.

Further particulars and Price Lists may be obtained at either of the above addresses.

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begs with the utmost confidence to solicit the order of Gas Companies, and persons using or selling Gas Tubes. Having for a long period supplied the largest Gas Companies and Consumers in the United Kingdom and the Continent with unvarying approbation, and almost exclusively the Local Boards of Health under Government Engineers, with Galvanised Iron Tubes and Connections, it has become an inducement to make such facts known.

Large Stock always being on hand, orders of any magnitude, from 10 to 100,000 feet, are executed promptly, and carefully tested by powerful hydraulic pressure before leaving the Works.

Boiler Tubes, Core Bars, Hollow Spindles, and Hydraulic Press Pipes, to resist 5000 lb. to the square inch, made on the shortest notice.

The only Prize Medal of the Great Exhibition, 1851, awarded.

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GAS METER MANUFACTURERS,

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LONDON,

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PATENT STANDARD SELF-ADJUSTING AND COMPENSATING GAS METERS,

by which the True Water-Line is constantly maintained, and accuracy of measurement at all times secured.

Manufacturers of LOWE'S PATENT MOTIVE-POWER METER, for situations where there is an inadequacy of pressure to supply the special requirements of certain consumers in low grounds during the day or night.

Also, Manufacturers of EXPERIMENTAL METERS, GASHOLDERS, GOVERNORS, MINUTE-CLOCKS, PHOTOMETERS, &c. &c., similar to those used by Mr. King, of Liverpool.

C. and Co. continue to manufacture ordinary WET METERS of the very best description, Mr. W. Crosley having been for many years the principal and confidential assistant of his relative, the late Mr. Samuel Crosley, of Cottage Lane, City Road, up to the time of his decease, in which capacity he communicated to W. C. the secret of the mixture of the metals which has rendered the Crosley Meter so durable and superior to all others, as is evidenced by a large number of them being still at work, after having stood the test of nearly a quarter of a century's use.

OXIDE OF IRON PURIFICATION.

MR. RICHARD LAMING has at last publicly acknowledged that he has no right to grant Licences. We beg that all parties interested will note this fact.

Our object throughout has simply been to maintain our only just rights, purchased for valuable consideration, and to warn the Public against Mr. Laming's specious and delusive offers; and we have referred to agreements only to bear out our assertion, that he had ceded to us all his rights of every kind to the Purification of Gas by means of any Oxides of Iron.

Gas Companies will scarcely wish to become arbitrators of Mr. Laming's imaginary private wrongs, as to listen to *ex parte* statements from either side. We, therefore, feel that the only notice we are called upon to take, of his repeated references to an alleged refusal on our parts to submit questions to arbitration, is, that his assertions are indelicate and unwarrantable, as we shall be prepared to prove at the proper time and place.

We confirm the position we have all along maintained, that any Invention of Mr. Laming's for the Purification of Gas by means of Oxides of Iron belongs to us, whether "*efficacious*" or useless; and that we still stand engaged to reward any one who will furnish us with legal proof of the use of any such Oxides by him, or by any parties under license from, or agreement with, him.

A word in conclusion. Mr. Laming states in his last advertisement, which has called forth this notice from us, that his "*Free*" Revivifiable Oxide is to be obtained *on very inexpensive conditions;* the nature, therefore, of the boon he proposes to lay at the feet of the Public would appear to rather peculiar; indeed, it seems as if a *quid pro quo* is expected for the *Gift*. Perhaps Mr. Laming will explain.

OWEN AND MERTENS.

Chemical Works, Mill Wall,
October 24, 1856.

PATENT GAS METER MANUFACTORY,

No. 66, Snow-hill, London.

WILLIAM SMITH, by the improvements he has made in the Wet Meter, and which he has secured by her Majesty's Royal Letters Patent, the accuracy of their registry is rendered certain by the introduction of the adjusting slide and hydraulic, whereby a Perfect Water Level is readily obtained, and the Hydraulic precludes the possibility of abstracting water from the meter by increased pressure or otherwise, thus surmounting the great desideratum of the Wet Meter. In his Patent Equitable Gas Meter neatness and strength are combined, the backs and fronts of the case being stamped by powerful machinery out of thick plate iron (tinned or galvanized); and the internal construction is of the best metal, which will resist the action of any impurity in the gas.

Old Meters may readily have the adjusting slide and hydraulic applied, thereby having accurate measurement assured.

Station Meters, Governors, &c., made on the shortest notice.

WAILES'S PATENT ECCENTRIC VALVE,

FIG. 1.

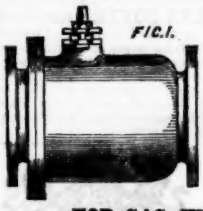
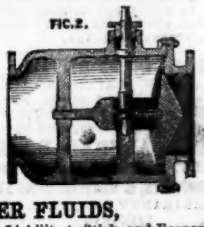


FIG. 2.



FOR GAS, WATER, OR OTHER FLUIDS,

Not to be equalled with regard to Compactness, Simplicity, Non-Liability to Stick, and Economy in Price.

Price, from 9s. to 12s. 6d. per inch diameter.

Further particulars may be had free, on application to WAILES and ROBINSON, Engineers, Founders, &c., 10, Palace Row, New Road, LONDON.

N.B.—Also Manufacturers of the Long and Short Slide and Screw Valves, for G and Water. The Long-Slide Valves for Gas kept in stock.

NO CHIMNEY WANTED FOR

RICKETS'S PATENT CALORIFERE GAS STOVES,

IN CHURCHES, HALLS, OR SHOPS;

And for Conservatories, or any close apartment, a pipe can be attached to convey away the burnt air.

RICKETS'S CHEAP GAS STOVE,

Price £1. 15s.,

Made of sheet-iron, suitable for heating small Counting-houses, Bed-rooms, Cellars, &c.

MANUFACTORY,

AGAR STREET, STRAND, LONDON.

WILLIAM PARKINSON AND CO.,

(Successors to the late Samuel Crosley),

COTTAGE LANE, CITY ROAD, LONDON,

Beg to announce that, in addition to the manufacture of GAS METERS, they continue the manufacture of METERS for MEASURING WATER, SPIRITS, &c., commenced, under Patent in 1849, by the late Mr. William Parkinson.

These Meters are as simple and durable as the Gas-Meter, and as correct as that instrument in the registration of the fluids passing through them.

JOURNAL OF GAS LIGHTING
NEWSPAPER

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NOTICES.

The next number will be published on Tuesday, Dec. 9, and the subsequent numbers on each successive alternate Tuesday, till our project of weekly publication is carried into effect.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 3, Parliament Street, Westminster; and orders for Advertisements to Mr. W. B. King, the Publisher, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, NOVEMBER 25, 1856.

NOTES ON PASSING EVENTS.

"IT is a hard thing to make an empty sack stand upright;" equally hard does it appear to be to induce the members of the Metropolitan Board of Works to take the position towards the First Commissioner of Her Majesty's Works and Buildings which we conceive that they are bound to take, as the representatives of the ratepayers of the metropolis. From the decision adopted on the 22nd of October, we were induced to believe that the majority of the board was decided upon managing its own business in the way it believed to be the most advantageous to its constituents, and the most in accordance with the spirit of the act, utterly without reference to the fancies of "Big Ben." But, after tamely submitting to an unwarrantable insult from that autocratic liberal, the Chairman of the Metropolitan Board—no doubt under the soothing influence of my Lord Mayor's hospitality—seems to have been anxious to assume the character of peace-maker, and to arrange some kind of Peachum and Lockit reconciliation between the unnatural parent of the board and his fractious offspring. It must have been a rich scene when "Big Ben" took King Thwaites by the button-hole, and tried to efface by an appeal to his feelings, as a well-fed man, the offended dignity of the chairman! And, really, from the results of this post-prandial arrangement, we would seriously recommend the First Commissioner to invite the whole Board to dine with him when he next desires to "snub" them. Casimir Delavigne said, in one of his plays, that

dans le siècle ou nous sommes,
C'est par les dîners qu'on gouverne les hommes;

and this law seems to hold in London and in Paris—perhaps, because we are, to some extent, "continentalized." But how are we to explain the eagerness with which the fasting board accepted the overtures made by the First Commissioner when he was "*Bacchi plenus?*" or how are we to explain their present anxiety to tide over the difficulty which has arisen in consequence of the extraordinary intervention of the former advocate of local self-government?

For we must not loose sight of the important fact that, as the Metropolis Management Bill now stands, the First Commissioner of her Majesty's Works and Buildings has practically the power of upsetting any decisions which the elected representatives of the ratepayers of the metropolis may adopt in matters of importance. We pass over, for the moment, any consideration of the correctness or error of such decisions, because that question has nothing whatever to do with the principle involved. So long as Englishmen are able to govern themselves, so long ought they to be entitled so to do, without any reference to a subordinate department of the Government, and to be left simply under the control of the Legislature and of the ordinary law of the land. Elected municipal bodies, no doubt, often err, and the Metropolitan Board has hitherto been far from immaculate; but, so long as such bodies *are* freely and fairly elected, they are tolerably certain to represent the opinions of their constituents; whilst the publicity of their debates (in our country) secures a general immunity from improper influences, or from the adoption of radically false doctrines. At any rate, the public itself has always in its own hands the means of remedying the errors or defects of this system, by merely returning better representatives at the next general election: but what security has the public that any Crown Minister, under our actual parliamentary system, should either know anything of the subject he assumes to decide, or that he should be competent to form an opinion upon the merits of any two rival projects which may happen to be submitted to him? In this particular instance before us, the absurdity of retaining the useless and vexatory powers of interference of the Commissioners of her Majesty's Works and Public Buildings (not of the First Commissioner only, as "Big Ben" reads the act) is the more revolting, because the Crown not only does not contribute in any way to the expense to be incurred, but it even takes advantage of any outlay the ratepayers of the metropolis may make, without compensation. If the Crown paid *pro rata* for the buildings within the metropolitan district, it might be entitled to be directly represented at the board; but the pretension that it is to have the direct control over the decisions of the latter, under the actual circumstances, is so monstrous, that it could never have entered into the imagination of any but a radical talker upon local self-government, or of an advocate for centralisation. For Sir B. Hall to talk "of his duty, and the spirit of the statute," and that kind of claptrap, is merely to insult the common sense of the public. He knows very well that whatever duty he may think proper to feel is entirely of his own making, and that he exercised every description of parliamentary tactics—not to use a harsher word—in order to prevent the clauses of the present mischievous Metropolis Management Bill from being discussed. We say flatly, that the Legislature never distinctly knew that it had created this new, and practically irresponsible, mode of defeating the intentions of the representatives of the ratepayers.

Then, if we turn to the real effects of Sir B. Hall's interference, what do we find to have been the case? Has he brought into the discussion such superior scientific information as to induce the public to believe that the great question of the metropolitan drainage would be better left in his hands than in those of the board? Most unhesitatingly we say that this has not been the case, and that he has acted upon advice which is practically worthless. The result of the interview between Sir Benjamin and the deputation from the board, which took place on the 20th, may be briefly stated by saying, that the First Commissioner intimated that he would consent to the outfall of the sewerage at a point in the river nearly 15 miles from London Bridge, because he had received a report from Captain Burstall to the effect that, if the sewerage were discharged there, at certain times of the tide, it would not flow back into the limits of the metropolis. To this we may ask, in reply—1. Why were the limits of the metropolis arranged by Sir B. Hall in the ridiculous manner in which they now exist? 2. What are Captain Burstall's tidal observations worth? 3. Why, when the act distinctly says that "the Metropolitan Board shall construct such sewers and works as *they* may think necessary for preventing all, *or any* part, of the sewerage within the metropolis from flowing or passing into the Thames in or near the metropolis," is Sir B. Hall to be allowed to interfere with them, because a naval officer, however able, thinks that part of the sewerage may flow back with the next tide?

Perhaps the answer to our first question, is that, however ridiculous the limits of the metropolis may be, they exist; and that, as facts are stubborn things, they must be respected: but then, why make such a parade of the spirit of the statute? This is, after all, a minor point—not so Captain Burstall's tidal observations; and we do contend that they indicate a very humi-

liating state of scientific education in our government offices. Think of the Hydrographical Department of this practical nation, which has so vital an interest in the conservancy of its rivers, being unable to communicate at once a series of observations upon the tides of the Thames, extending over many years! think of its representative glibly uttering an opinion on a question supposed to affect the health of 2,500,000 of people, and an indefinite amount of money, merely upon his own observations, carried on during one lunation, compared with other observations of an equally incomplete nature! The tides of the Thames are of the most complicated description; and it is a farce to pretend to say in what manner they may affect the flow of the "sewage," simply from accidental and partial experiments, such as those hitherto quoted. If the wind had blown steadily for some days from the south-west, and had then veered round to the east, blowing with great force, the tide would, in all probability, have presented a result, during neaps, more unfavourable even than it did during the spring tides, when Captain Burstall made his experiments. His reasoning, after all, depends only on observations which were made in June, near the solstitial points. What takes place at the equinoxes? especially if the conditions of the direction and force of the wind should be such as we have above supposed, and which, in fact, often occur? If Captain Burstall's and Sir B. Hall's position be at all justifiable, it must be because they object to *any* of the "sewage" flowing within the limits of the metropolis. If the point at issue be as to how much may so flow, or how often it may flow, the Metropolitan Board ought alone to decide it, because the act expressly leaves it to their decision by the words—"*as they may think necessary for preventing all or any part of the sewage*," &c. If the point at issue be whether the outfall is placed at such a point as to prevent any part of the sewerage from flowing in, or near, the metropolis, we contend that Sir B. Hall is not in possession of any information which can enable him to decide. In the meantime, the great London drainage has been retarded for twelve months by this exercise of Sir B. Hall's capricious tyranny, and we hope that his constituents will bear this fact in mind on his next election; for it is a farce to suppose that this great work can be executed without a special act of Parliament, or that the House of Lords would suspend its standing orders for the defence of private property, even if the present corrupt House of Commons should so far forget the principles of justice as to allow the Ministry to bring in a bill for the purpose of carrying out this work, according to any scheme agreed upon by Sir B. Hall and the now pliable Board.

This whole business is so little to the credit of our public men, or of our scientific or professional men—so much in the "*mons parturiens*" style—that we revert to it with pain. We only dwell upon it, indeed, because it involves the great principle of local self-government, independently of the intervention of any central authority. Alas! it seems that we are in this matter fast verging towards the lazy indifference of continental nations, and are becoming anxious to sacrifice the blessings of freedom, in order to avoid the struggle and effort which must always be supported by those who are worthy of that blessing. But the little wisdom hitherto exhibited by Sir B. Hall and his compeers ought, we think, to convince the advocates of "strong parental governments" that, when the latter are good, it is, as Alexander of Russia very truly said, simply from "a happy accident."

In our last number we alluded to the report upon the metropolis water supply lately issued by the inspectors of the General Board of Health, and promised to return to its examination. So far as the document itself is concerned, we hardly think that it merits this notice; and we take the liberty of saying that our own columns, of the months of February and March last, contained all the valuable information which has lately been printed, at the cost of the nation, in the imposing form of a blue book. There is, indeed, in this official production nothing of importance which we have not already given, and there is nothing in it worth extracting, excepting it be the incidental disclaimers it contains of the former Board of Health theories, and the proofs thus furnished of the mischievous action of that body. The report is, in fact, only of value on account of the incidental observations it suggests.

It commences with a long and elaborate-looking chemical report on the quality of the supply of water to the metropolis, by Messrs. Hoffmann and Blyth, which we have no hesitation in classing at once in the same category as Captain Burstall's tidal observations, or in calling it utterly worthless as a scientific document. Supposing chemical analysis to be a safe guide in these investigations—which we here at once declare that we do not believe to be the case—it can only be of use on the condition of the average result having been obtained from a series of detailed analyses of the waters made day by day, and almost hour by hour. To pretend to form an opinion of the quality of the waters of a river like the Thames (which drains an area of more than 6000 square miles, and flows over nearly every member of the secondary or tertiary formations of our island) by analysis made on any two or three days, is neither more nor less philosophical than the conduct of the man who endeavoured to persuade his acquaintance to judge of his house by exhibiting a brick. The chemical quality of the waters of the Thames varies at almost every moment; and, therefore, Messrs. Hoffman and Blyth's analysis were only true—if they were true—for the waters taken at the particular hours they selected: during the rest of the year, who can say how the Thames waters varied?

But we have a far graver objection to this mode of arriving at an opinion upon the real merits of a water supply. Analytical chemistry is quite a new science, and doctors even differ as to the credit to be attached to its indications. The recent trial of Palmer has not served to advance this science in public estimation; and, at any rate, it was then proved that the opinions of pathologists were more to be trusted, when a question of the constitutional influence of any substance was concerned, than were the opinions of analytical chemists. But the effects of an improved water supply cannot be ascertained at once; and, on this score also, do we protest against the slip-shod philosophy which is admitted in high quarters at the present day. Then, again, we very seriously question whether the modes of analysis adopted afford any real indication of the real composition of river waters; for, firstly, who is to say what new pyrogenic combinations may take place, whilst the water is being evaporated? And, secondly, we are convinced that, if the various ingredients said to be present were mixed up, by a kind of rude practical synthesis, they would not upon a second analysis yield similar results to those of the first operation. There is, indeed, a great tendency at the present day to abuse analysis in all branches of philosophy and science; society forgetting, the while, that Nature herself works by vast synthesis. But when the modes of analysis are notoriously defective, it behoves us to be especially on our guard against hasty conclusions derived from such imperfect evidence.

There is something very remarkable in the decided, but quiet, manner in which Messrs. Austin, Ranger, and Dickens poohpooh all that Mr. Chadwick had said about the economy of tea and soap to be obtained by using soft water; and the observations they make upon the working of the softening process at Plumstead, must also be considered a fair sample of the mode of "damning with faint praise." So long, however, as this last question is left entirely to be decided on its economical merits, no harm can be done; and we therefore congratulate the inspectors upon having at length learnt common sense, both with respect to the relative merits of hard and soft waters, and to the "consumption of smoke." Why have they not, however, the courage to avow that they have misled the Government in this matter of smoke consumption? It would be far more creditable were they at once to avow the error into which they have been lead, than thus, in an underhand way, to prepare the public for the abandonment of this additional dogma, which they were formerly so anxious to propagate. The inspectors, in fact, now never use the term "consumption of smoke" without putting it within inverted commas. Altogether this report is utterly worthless as a scientific document; but it is curious on account of its omissions, and of its admissions.

By the way, talking of good jokes, we pray our readers just to imagine the reception Edwin Chadwick, Esq., C.B., administrator of the L. G. O. C., must have received at Southampton when he offered himself as candidate for their representation in Parliament! Think of his presenting himself in a town where the rating for the Board of Health—his interesting bantling—is only 10s. 8d. in the pound!

We have been favoured by some information from the City authorities upon the subject of the unpleasant discussion now going on between them and the New River Company; and really we must say that both parties appear to us to have behaved with more temper, and less desire to overcome difficulties, than was advisable. The New River Company are evidently just now disposed to exact the uttermost farthing—a course

which is as impolitic as it is unjust; but, at the same time, it does seem to us that the City ought not to expect that the Company should continue to supply, for 5s. a-year, the urinals which require a quantity of water able to be sold for £13. 2s. 6d. There is great truth in Mr. Hayward's remark, that the City derives no profit from these causes of water consumption; but, by the same rule, there can be no reason for their establishing places of public convenience at the expense of a private company. This is somewhat of an illustration of the fashionable Socialism of the age; and we call the attention of the public, who pay for the water, to the fact, that their rates must be increased in order to cover the sacrifices imposed on the company. It is fairer, and, in the end, will work better for all parties, that public services should be paid for in the same manner as any others; and, on that score, we think that the New River Company is right in asking to be paid for the water it actually supplies. The rate of charge is quite another affair, and therein we think that the City has great reason for complaint. Both parties would do well to recollect the golden rule—"Do unto others as you would be done by." If they would approach the question in this spirit, we would undertake to settle it in half an hour; as it is, there appears to be a good chance for a long lawsuit, and much ill blood—all of which might easily be avoided.

ON THE WATER-SUPPLY AND SEWERAGE OF BRUSSELS, AND ON SOME OF THE PUBLIC WORKS OF BELGIUM.

Belgium is perhaps, in every respect, one of the most interesting countries in Europe to the philosophical inquirer into the effects of political and social organisations. Its very existence as a separate nation, at first sight, appears to be an absurdity, especially at the present day, when so marked a tendency exists for the races who speak the same language, and who occupy the same geographical divisions, to blend themselves into great nations. A cursory glance at the map of Europe would induce any superficial observer to believe that Nature had intended the Rhine to form the boundary between the Gallic race settled on the west bank, and the Germans settled on the east. Oddly enough, too, although numerous minor exceptions to the rule may be observed, the Gallic and Germanic races have, in the main, adopted this geographical division; and even when, in consequence of the awful confusion of the middle ages, the exact limits between the various tribes were broken down; and when subdivisions of the Germans established themselves on the west bank of the river, they have been unable to retain their peculiarly Teutonic character, or to resist the tendency of French civilisation, to substitute itself for that which was indigenous. In Belgium this law has prevailed, perhaps, in a more striking manner than anywhere else; and the student of history who has traced the inevitable progress of the inhabitants of Flanders towards the moral French unity, notwithstanding the long rule of the Burgundian, the Spanish, and the Austrian families—or, what is more surprising still, notwithstanding the existence of the distinct and cherished associations of the old Flemish and Wallon languages—such student must at times suspect that there is something strange, if not unnatural, in the existence of Belgium as an independant state. Yet its absorption into the great mass of French centralisation would, we suspect, be a source of misery and suffering at first; and in the end we also believe that it would be a misfortune to the Belgians themselves. It is a characteristic of this anomalous nation at the present day, that, although possessed of great talents, it casts itself even more entirely upon the central government for guidance and protection than the French themselves do, unfit as the latter notoriously are for the discharge of the noble duty of local self-government. In this little kingdom everything must originate from the State. Railroads, canals, highways, docks, water-works, sewerage, if not immediately within the sphere of the Minister of Public Works, are all necessarily submitted to his control; and no branch of commerce can be established without the intervention of some other department of State. So far are the Belgians, as a nation, from participating in the feeling which makes every right-minded Englishman regard a government functionary as a species of state pauper—a necessary evil, but still to be regarded with a kind of contempt—that it is with them an object of ambition to enter any branch of the public administration; and, once so placed, they are content to perform imaginary duties for microscopic salaries, whilst at the same time the whole trade and industry of the country depend for their daily existence upon the conduct of the ruling powers. A country which has accustomed itself to such a system of dependance upon the State would, no doubt, be considered by M. de Tocqueville admirably prepared to receive the French system of centralisation as it is now practised; but, at the same time, it would find itself utterly unable to contend with the evils and the abuses of that system. Belgium is, even now, over centralised; and it only escapes the inevitable consequences of that pernicious error by the fact, that the state machinery is not so vast as to prevent examination and control, whilst its wonderfully liberal electoral laws enable the nation itself to act directly upon the Government. This could not be the case if it were to become absorbed into the French nationality (towards which, nevertheless, it is fast gravitating); and therefore it is that we hold that, for some time to come, local interests may prevent the application of the broader general law to which we have adverted.

These remarks forced themselves upon us during the recent visit we paid to Brussels on the occasion of the *Congres de Bienfaisance*—a meeting which seemed to us to illustrate very forcibly the strange mixture of centralisation and of apparently free discussion which prevails in this country of Belgium. It was a mere farce to call it a congress, for the whole affair consisted in listening to a few set speeches; and when we ourselves expressed a wish to be allowed to contradict Mr. F. O. Ward's extraordinary distortions of facts (not to use a shorter word), we were told that the "committee sought as much as possible to avoid discussion." But be this as it may, and leaving this very strange exhibition of our own governmental authorities to find its level, which it assuredly *shall* do, we found that the system of social action in matters Englishmen usually consider to belong to the domain of private industry, had been long, and we will at once add, with great skill and success, applied to the municipal works of the town of Brussels. Thus the water-supply of the capital was entirely in the hands of the municipality; the sewerage was also under its control; as were likewise the improvements of the town, and the construction of public buildings. In the latter respect, it may fairly admit of question whether Brussels has gained much of late years, for the taste of the most recently constructed buildings is more than equivocal. But the plans of the town improvements have been very skilfully prepared, and very well executed; and, indeed, no city can be named which has gained more, during the last 15 years, than the Belgian capital in all matters connected with street distribution. Very wisely, the municipal authorities have kept aloof from the absurdities of Mr. Ward's system of "tubular circulation," and the general sewerage of the town is in a very satisfactory state. No doubt the continued use of the river as the general outfall is a mistake, and one which, sooner or later, must be obviated by the construction of parallel intercepting sewers; for it is not reasonable to suppose that in the present day a town so advanced in civilisation as Brussels unquestionably is, will long retain so foul and so noisome a nuisance as the big open sewer, which is all that the river can now be properly considered to be. This is merely a question of time, however; and it is to be observed, that the medical authorities of Brussels do not believe that the health of the lower quarters of the town suffers from the foul emanations from the dirty waters of the Seine, black in colour and charged with sulphuretted hydrogen though they unquestionably are. For the present, the engineers of the municipality very wisely direct their attention to bringing the street and the house drainage into accord with the requirements of the age; and they do so by making sewers large enough to perform all the functions they ought to fulfil.

The work in which the municipality of Brussels has, however, taken a decided lead over its compeers in other highly centralised countries, is in the water-supply, which it has recently undertaken, and nearly completed, with remarkable success—we believe, under the guidance of M. Carré, its engineer. It is estimated that there are in Brussels and the Fauxbourgs, about from 15,000 to 16,000 houses, and 200,000 inhabitants; and the works already executed for the new supply have cost, in round numbers, about £240,000; thus affording another illustration that it is not possible to give even a municipal water-supply without an outlay on the average of from 20s. to 25s. per head of the population. We commend this fact to the consideration of those who are disposed to believe that a water-supply can be effected for an average charge of 1½d. per tenement per week, or 6s. 6d. per annum; because, if only five persons be allotted to each tenement on the average, it follows,

inasmuch as the working expenses of a water-supply are usually 50 per cent. of the receipts, that, in order to pay 5 per cent. on the capital invested, the minimum charge must be 10s. per tenement per annum, without taking at all into account the cost of the private distribution, or the sinking-fund.

But, leaving this question for the present, it may be briefly stated that the supply of water for Brussels is obtained from the middle eocene strata of the commune of Braine d'Alleu, at a place called Witterzée, near Nivelles, and at a point where the natural surface of the ground is situated at about 305 feet above the level of the sea at Ostend. The various natural streams which are here found are brought in an aqueduct to a small reservoir near the town, and thence are carried by means of a double series of pipes, 2 feet in clear diameter, to the distributing reservoirs situated in the Faubourg d'Ixelles. A second series of springs, which flow at a lower level than those above mentioned, are collected at a place called the Moulin Léonard, and there raised by means of a duplicate 10-horse power engine into the principal aqueduct: this has a section of 3 feet 7 inches wide by 5 feet 7 inches to the underside of the arch, and an inclination of 14 in 100,000. The length of the aqueduct from the Moulin Léonard to Ixelles is about 19,450 yards, and the length of the pipes is about 919 yards. In the course of the aqueduct itself there is only one important work, viz., a bridge at Mont St. Pont, about 40 feet high, and 656 feet long. The quantity of water which thus flows by gravitation is about 2,420,000 gallons in the 24 hours, whilst the total quantity flowing into the reservoirs at Ixelles is 4,180,000 gallons. The surface of the water in the latter is about 295 feet 3 inches, and the bottom 287 feet above the level of the sea; or the effective head for the supply of the houses near the Porte de Namur is about 147 feet 6 inches, and for the lower part of the town, about 230 feet—to be diminished, of course, in both cases for the friction and loss of head by bends, &c. A further additional supply of about 22,000 gallons per day is also obtained from the spring of Broebelaer, which is conducted to the Place du Congres for the supply of the quarter of Finisterre; thus making the total available supply, for a population of about 200,000 souls only, 4,202,000 gallons per day, or 21 gallons per head on the average. From the results obtained in England and in America, this must be considered to be far less than will ultimately be required; indeed, in one of our late numbers we showed that the actual consumption in London is at the rate of about 38 gallons per individual per day, and the last returns of the superintending inspectors of the General Board of Health confirm that opinion. As the municipality of Brussels have adopted the system of constant supply—one of the most hazardous experiments of modern times, especially in such hands—we are convinced that ere long it will find it necessary to extend its works; and the remarkable cleanliness of the Flemish race induces us to believe the more readily that when water can be had easily the consumption will be enormously increased. We do not hesitate to say that, before the inhabitants of Brussels have enjoyed a constant supply of water for 10 years, the municipality will have to double its works.

The distributing mains and submains are, as usual, executed at the cost of the municipality; the expense of the house services is paid by the party applying to receive the water; but it is understood that these works are to be executed by the town contractors, under the inspection of their engineer. For ornamental purposes, the water is supplied either through a diaphragm or through a mètre; but for the domestic supply, no means of gauging are adopted, and the price is regulated as follows:—There is, firstly, a proportional rate of 1 per cent. on the official valuation of the property, and then a fixed payment according to the following scale:—

2 francs	per propriety, under a yearly rental of						100 frs.
4	„	ditto between				100 and	150 „
5	„	„	„		150 „		200 „
6	„	„	„		200 „		250 „
7	„	„	„		250 „		300 „
8	„	„	„		300 „		350 „
9	„	„	„		350 „		400 „
10	„	„	„		400 „		500 „
11	„	„	„		500 „		600 „
12	„	„	„		600 „		700 „
13	„	„	„		700 „		800 „
14	„	„	„		800 „		900 „
15	„	„	„		900 „		1000 „
16	fr. per prop., between				1000 „		1200 „
17	„	„	„		1200 „		1400 „
18	„	„	„		1400 „		1600 „
19	„	„	„		1600 „		1800 „
20	„	„	„		1800 „		2000 „

and then an additional franc for every increased rental of 400 francs. According to this tariff, the charge to a house of about 1000 francs rental (£40 English) would be 25 francs, or £1; that for a 2500 franc house (£100) would be 47 francs, or rather less than £2; and we confess that we neither perceive the justice of diminishing the proportional price to the wealthier tenant, nor do we believe that these rates will suffice to remunerate the town for its outlay. With the resource of the octrois to cover any deficiencies in their budgets, it may be some time before the citizens of Brussels discover this assumed insufficiency of rating; but herein lies, we believe, precisely the injustice of the execution of works of this description by municipal bodies. Under their control, it is hardly ever possible to throw the burthen upon those who ought to bear it; and it almost invariably happens that they who are the poorest are the most heavily taxed, in order that the ruling classes may be favoured. This occurs at Manchester with its strange juggle of gas and water works: it occurs in a more revolting form in the continental cities, where the absurd and iniquitous octrois are still retained.

But, if an objection may be raised to the intervention of the municipality in the works connected with water-supply, it may be raised with infinitely more force against the execution and working of the railways by the State. The only argument worth examination we have heard in favour of this system is, that there would be danger, in a small country like Belgium, in allowing the monopoly of the transit of goods and of passengers to be in possession of any association. This argument is, however, only specious; because, in the first place, it would have been in the power of the legislature to have prevented any such contingency; and, even if it should have arisen, it is tolerably certain that a monopoly in the hands of a trading company would be worked more intelligently than it has been by a government organisation, devoid of the spur of a direct pecuniary interest. It is notorious that the lines, the rolling stock, and the buildings of the state railways in Belgium, are inferior to those of any other country in Europe; and that the rate of travelling is slower, on account of the impossibility of running heavy locomotives on light rails; whilst, practically, the rates of transport of merchandise are more expensive than those of the principal French railways. There are, however, numerous "*chefs*" to be seen walking about all the stations, with their hands in the pockets of their balloon trousers; and so convenient a governmental machine is this railway staff, that we have even heard that the station-masters have been changed on a change of administration—a tale we commend to the notice of our administrative reformers of the school of Mr. Chadwick. However, the practical result of the Belgian railway system is, that it does not pay more than from 5 to 5½ per cent., although it is not borne down by any unproductive branches; and that it would require a very large addition to capital to place the way, works, and rolling stock, in proper working order. In the meantime, the directions followed—or, in other words, the laying out of the railways—have been so badly selected, that they constitute a permanent burthen upon society, which is of course utterly without remedy, because no competing lines will be tolerated; whilst the insufficiency of the rolling stock prevents the railways from rendering the services they ought to do. The Belgian nation may depend upon it that it would gain greatly by removing the working of its improved communications from the hands of the State, and by leasing them under fair terms to a company. This course would, however, diminish the number of places at the disposal of the ministry; and so all parties who are anxious to secure what it is the fashion to call "strong governments," naturally oppose a change which would curtail the means of parliamentary influence. Let us hope that we may learn wisdom by the errors of our neighbours, and pause in the course of blind admiration for continental institutions which we have of late so thoughtlessly adopted. In no country, as we said before, can the pernicious effects of centralisation, and, we would add, of the law of inheritance of the *Code Napoléon*, be more distinctly traced than in Belgium; and it were much to be desired that our political economists should study their histories.

FALL OF THE PONT DE L'ARCHE BRIDGE.

A CURIOUS accident has lately occurred upon the course of the Seine, to which we invite the attention of our hydraulic engineers. The old bridge of Pont de l'Arche—a mediæval structure of great antiquity, and more remarkable for its massive picturesqueness than for its constructive beauty—fell, without warning, on the 12th of July last; but so little intercommunication does there appear to be between us and our neighbours in these matters, that we have only heard of the accident within the last few days. The bridge formerly consisted of 24 arches—some semicircular, others ogival—of about 33 feet span; and latterly a few of those on the right bank have been altered, in order to form four wider openings for the navigation, each of about 102 feet span. The lower part of the Seine, near Quillebœuf and Villequier, has also been much modified by the execution of some lateral banks, which have produced the effect of concentrating the tidal scour, and guiding it with greater force into the navigable channel. Now, the bridge at Pont de l'Arche is situated nearly at the point where the tidal action used formerly to cease; and it appears to us very probable that the contraction of the water-way by the piers of the old bridge had much to do with limiting its range. The increased water-way offered by the alteration of the navigable arches (which was only finished in 1855) in all probability, then, increased the scouring action of the river; and this, again, may in turn have been increased by the modification of its course nearer to the *embouchure*. From both causes we believe that a great change has taken place in the bed of the Seine at this point, and that, in consequence, the original structure has been undermined. In rebuilding the bridge, no doubt the water-way will be still further increased; and it is possible, under such circumstances, that the railway bridge at Le Manoir (a little above Pont de l'Arche) may also be affected. The tide will also, we have no doubt, be driven further up into the country, and thus the barge navigation of the Seine be materially improved.

To us this accident is, however, principally interesting as furnishing an illustration of the danger of making any alterations in the *régime* of a tidal river, without duly examining all its contingent bearings. The alteration of Blackfriars and of Westminster Bridges, and the embankment of the Thames, are frequently and lightly talked of by our amateur engineers; yet it is more than probable that either of those operations would affect the stability of all the other bridges on the river, as well as of the various structures on its banks. May the fate of the Pont de l'Arche Bridge induce our rulers to pause ere they hastily undertake works of a similar character!

THE "BOX" NUISANCE.

Mr. JOHN BOX: There are more "Boxes" in the world than *one*.

CHAIRMAN OF CHARTERED GAS COMPANY (with melancholy acquiescence): I have found that out, sir.—*Vide* Report of last Chartered meeting.

"MORE Boxes than *one!*" Oh! painful truth! where is he who has not long ago found out to his cost that "there are more Boxes than one?" If such an individual exist, let us apostrophise him:—"Most lucky dog! long may'st thou find shelter from a world of windy woes in that blessed ignorance! Long may'st thou refuse to taste the "bitter apple" of knowledge contained in the 'Box of colocynth!' Oh! enviable mortal! for thee all Boxes, even Pandora's, remain unopened, and thou art innocent as a baby of their flatulent contents!" But, alas! we apostrophise in vain; every body knows too well that "there are more Boxes than one in this world;" though, according to the ordinary dispensations of Providence, *one* would seem to be fully enough for a small planet like ours: one sun, one moon, one Box. There is an old saying, that "troubles never come singly;" and it would appear to be the same with regard to "Boxes." The Siamese twins were not more closely united: turn wherever we may, it is still the same, "*Box et præterea nihil.*"

A certain philosopher was once very much puzzled to find out a use in the economy of nature for the common "bedbug." Now, we are almost in a similar "fix" with regard to these "Boxes:" not that for one moment we question the general proposition, "Everything is useful"—quite the contrary; our difficulty is merely to discover the peculiar purpose which they serve in the social system. The cackling of a goose once saved the capitol of Rome from destruction by the Gauls; and we have no doubt whatever that either Box No. 1 or Box No. 2 could "prove whether we are progressing or retrograding," if it contained the requisite information; but this exactly raises the whole question of whether there is anything in the Box or not. Now, "empty vessels make the most sound;" and, judging by the past, we very much doubt the propriety of permitting these empty Boxes to usurp, as they do, the whole time of the various gas meetings at which they may happen to be present. We are no advocates for concealment or mystery, and have always done our best to lay a candid narrative of the financial position of every gas company before our readers, because we have felt that this was really the true interest of the companies themselves: but to see one or two noisy individuals frittering away the time of many others in mere verbose clamour, as foreign to common sense as to common decency, is a line of conduct which will ever meet with our unqualified condemnation. The directors of a gas company are invariably gentlemen chosen from the body of the shareholders by the shareholders themselves; consequently they have a right to expect and to enjoy the confidence of their constituents—a confidence, be it remembered, not limited to purity of motives, but also including executive capacity; and it seems to us to display no ordinary want of proper modesty in a man who, in such a presence, can start up and challenge both the patience and the avowed decision of the rest of his compeers by pretending to decide the actual condition of a large commercial undertaking from a few hasty *data* snatched out of a clerk's office, the real managers meanwhile expressing a contrary opinion.

It is to be hoped that these observations will be received in a becoming spirit by those for whose special benefit they are penned; and with this brief hint we shall be very glad to quit so delicate a subject. The proper exercise of inquisitorial power by a shareholder in a gas company is equally manly and judicious; but he must be a pestiferous ass indeed who brays *every time* he has an opportunity of opening his mouth.

Circular to Gas Companies.

IT was remarked of Hannibal, when, after the victory of Cannæ, he declined to march upon Rome, that "he knew how to fight, but not how to conquer;" and the same axiom seems applicable to the authorities at the City Gas-Works. Like Hannibal, they have had their victory, and, like him, they are incapable of using it to their own advantage. The cry is now for a coalition with the Great Central, under an illusion that, in this way, Mr. Gray's hope of 4s. 6d. gas may be realised; but nothing in the world can be less likely to attain this end, upon the only conditions under which it would be of any permanent value to the gas interest of the kingdom at large, or the special interest of the City Company in particular. If, however, the object in view be the perpetuation of 4s. gas, then we see no reason to object to the contemplated amalgamation: by such means, there is no doubt a great economy may be effected in the working of both concerns, and much money saved in the extinction of fees and salaries for surplus directors and officers of every description. This is a commendable basis upon which to undertake an amalgamation, and one that, under any circumstances, must meet with universal approval, not to mention the advantage gained by the cessation of a ruinous competition in respect to consumers, that only confers additional facilities upon the harpies of society to plunder both companies.

But we cannot understand how Mr. Gray can be sincere in a desire for 4s. 6d. gas, and, at the same time, seek to remove the very argument which, either in the eyes of the public or in the House of Commons, could warrant such a price. It is not capable of disproval that what is called "monopoly" is in reality a means of supplying *cheaply* that which, under competition, must be more *dearly* produced. Take the case to its full bearing, and let every man make his own gas, his own coke, and his own "beer," and see whether, in the first two, he can supply himself as cheaply as the Imperial Company, for example, will supply him; or, in the last, as well and economically as he may purchase from Barclay and Perkins. But the British public is fond of what it calls "competition," and has a perfect "monopolo-phobia" in respect to the most economical application of large capital: it is never so happy as when gazing upon the inviting placard, "No connection with any other shop," and seems never thoroughly contented but when two rival interests are cutting each other to waste, with the undisguised intention of making John Bull in the end "pay the piper." With the greatest facilities in the world for making perfect railway communication throughout the kingdom, we are worse off both as to expense and comfort than any country in Europe, merely because we were so jealous of monopoly that

we allowed, nay encouraged, the expenditure of more money in foolish parliamentary litigation than would, in many instances, have made the railway in dispute; and, having thus caused the investment of an enormous surplus capital, it is the unavoidable interest of every existing railway to perpetuate the evil by adding as much waste capital as possible to the cost of every fresh undertaking.

To this monstrously absurd state of things the anti-monopoly cry about gas has been no exception, and we presume the public is content with both results: it is a disease of the national mind, and must be treated accordingly; hence the danger of coalition until the real truth of the case has been made apparent to the great bulk of society. If every one knew as well as we do that, with a never-ending change in the value of the raw material, gas could not be sold continually at the lowest price at which, under the most favourable circumstances, it can ever be made, we would gladly hail a coalition, not only of the City and Central Companies, but of every one of the metropolitan companies—and this we would hail in the true interest of the public, even more than in that of the gas companies themselves.

But does any one believe that our lengthened experience in such matters is a fair measure of the knowledge of a majority of the inhabitants of London? The question is preposterous; and therefore we view with alarm a movement calculated to hide from the public the great truth we have all along inculcated, that, "with an article of uncertain value like coal, it is impossible to sell gas in the metropolis, and pay a reasonable interest upon the undertaking, at a uniform rate of 4s. per 1000 cubic feet." Let us not, then, attempt to hide or gloss over a fact the thorough comprehension of which can alone give stability to the manufacture of gas. No matter with whom the error originated, or where the blame rests, that error which fixed the price of London gas at 4s. must be exposed and denounced.

Without pretending that Mr. Croll is cleverer than any one else, we have never questioned that his experience was large, and his talents at least of average quality: that his heart and his interests were united in his efforts to realise 4s. gas, no person can doubt; and hence, when we find him fairly avowing his inability to go on with it, we have little hesitation in saying, that the Great Central Company will never be able, either to obtain another contractor on the same terms, or to manufacture gas for itself and the City Company, so as to realise the dividend allowed by Parliament to such undertakings. We therefore think this coalition premature and ill-advised.

It has been hinted, and we shall be delighted at the realisation of the fact, that the case of "Broadbent *v.* the Imperial Company" is not yet finally settled, but that it will be carried a step higher, to that last constitutional appeal which has so frequently elicited the exclamation, "Thank God, there is a House of Lords!" Greedily willing to believe this statement, we forego for the present our criticism upon the very questionable proceedings by which the conduct of that affair has all along been so disreputably characterised. We will not, therefore, attempt an analysis of the late proceedings before the "legal brother," *videlicet*, arbitrator, nor those which passed in the presence of the Vice-Chancellor; nevertheless, there are two points upon which we must be permitted to offer a few words of comment. In the evidence before the arbitrator, and also in the affidavits sent to the Vice-Chancellor, it was denied by the scientific evidence on the plainiff's side, that the substances evolved from the gas manufactory of the defendants were similar to, or identical with, those from common chimneys. Now, some of these scientific witnesses have since had occasion to examine and report upon the substances evolved from the gas manufactory of the City Company, and what do we find? Why, that these very witnesses declare the volatile products from the City Gas-Works to be the same as those from common chimneys! If the name of science is to be thus prostituted, the sooner it is excluded from our courts of justice the better for society.

Our next remark applies to the statement of the Vice-Chancellor, that "evidence of a negative character, that market-gardens had flourished in the neighbourhood of gas-works, had not been put in by the defendants;" but evidence of this very kind was offered before the arbitrator, and refused or slurred over by him. There was no evidence offered before the Vice-Chancellor himself to show that in several of the country gas-works there were gardens of the most flourishing description; and if this evidence did not, as the Vice-Chancellor asserts, appear before him, the disgrace, for such it is, rests not on the Imperial Gas Company. We trust, however, that our country friends will favour us with a few well-authenticated facts as to the existence of flourishing gardens in the immediate vicinity of gas-works. Such a list may yet prove useful, even in this particular instance, but is sure to be valuable to the general cause at some future period, for the Broadbents are a numerous race—worse luck!

Correspondence.

BRISTOL GAS.

Sir,—I am reluctantly compelled to trouble you again, in reply to Mr. Lewis Thompson, albeit, not as a *general* answer to his letter, since scientific men do not usually discuss matters of fact in the phraseology of a well-known locality near the Thames Street end of London Bridge. I should, indeed, decline all argument with him at all, till he could be brought to assume somewhat of the feelings and language of a gentleman; but, as that is a consummation hardly likely to come about, I must in the meantime pin him to facts and figures which, with all his chicanery, he has already found to be edge-tools inconveniently sharp for bungling hands.

Mr. Thompson asks, "What did Dr. Griffin analyse?" I reply, *The crusts that formed on my boiler*. He further asks, "What do they consist of?" I answer, in the words of my original paper, *Of hydrated sulphate of copper, with traces of chlorine, lime, iron, and other impurities*. He remarked on this, that it was "incredible" that they did not contain ammonia. I rejoined, that I had not tested the deposit for that substance, well knowing, from the circumstances of its formation, that it could not contain more than mere traces. A careful further analysis proved such to be the fact—less than one-half per cent. being present. In face of this, he now has the impudent effrontery (for no other term will characterise it) to assert that it was the *ammonio*-sulphate of copper (containing 27½ per cent. of ammonia) that I professed to have found on my boiler! He goes on to say, however, that the substance in question could be neither the tribasic nor the simple ammonio-sulphate; and undoubtedly it was neither the one nor the other, since ammonia was almost entirely absent, in spite of Mr. Thompson's own insinuation to the contrary. He further states, that the tribasic sulphate of copper and ammonia, whose composition I gave in my last communication, decomposes at the temperature of the air. So far is this from being the case, that even at 300° (when it becomes a *green* powder) it retains 17½ per cent. of ammonia, which is only completely expelled at a temperature of 500°. (*Gmelin's Handbook of Chemistry, Cav. Soc.* V., p. 449.) Now, in all the above states this compound contains exactly the same proportions of oxide of copper and sulphuric acid (namely, 32 per cent. of each) as the pure hydrated sulpate of copper that I found. I very much doubt whether the incrustations ever contained any sensible amount of ammonia, as the very small portions present in purified gas must be almost wholly decomposed in passing through the flame. But, again, says our Chameleon Cato, the substance cannot have been the simple sulphate, since that is *white*, whereas your product was "*green*." It was nothing of the kind. If Mr. Thompson refers to my original paper, he will find it described as a "greenish-white" (which I believe usually implies *white* with a shade of green); and there is no doubt that it *was* anhydrous when it fell from the boiler. Whence, then comes the water that I found to exist so largely in the efflorescence, though I did not think it necessary to determine experimentally its exact amount? If he again turn to "Gmelin" (v. 430), the mystery will be solved for him. "Anhydrous sulphate of copper, exposed to moist air for three days, absorbs the five atoms of water belonging to ordinary blue vitriol." Now, as this efflorescence had lain on the slate beneath the boiler—not three days only, but as many months—it would hardly excite surprise in any one not wilfully blind, that I should have found it fully hydrated. Furthermore, "Anhydrous cupric sulphate rapidly absorbs ammoniacal gas to the amount of 54 per cent." (*Gmelin*, v. 448.) It is, therefore, quite as probable that the half per cent. of that alkali which it contained had been taken up from the air of the neighbouring laboratory, as that it proceeded from the gas: but that matters little. Mr. Thompson may, *modo suo*, pretend that, if the crusts consisted of *hydrated* sulphate of copper, they *ought to be blue;* but, if he take the trouble to pound some blue vitriol in a mortar, he will find that when very finely divided it appears almost *white*, as I described my efflorescence to be. He states, by the way, that, according to Berzelius, sulphate of copper becomes anhydrous at 104°. Berzelius says no such thing, but that it loses at that temperature two out of its five atoms of water; the remainder is not expelled below 460° Fahrenheit. Perversion appears, however, to be so ingrained in Mr. Thompson's moral nature, that he cannot quote even one simple sentence without falsifying it!

As regards my "vipero-Iscariot" proceedings towards those spotless martyrs, the Bristol Gas Directors, I may mention that it was not of my own seeking that the obnoxious paragraph was first

made known in Bristol. The next Saturday after its appearance in the *Pharmaceutical Journal*, it was reprinted and made the subject of a leading article in the *Bristol Advertiser*, without the remotest connivance or knowledge on my part.

I am, sir, yours most obediently,

FREDERICK W. GRIFFIN, Ph. D.

Bristol School of Chemistry, Nov. 19, 1856.

"Time was,
That when the brains were out, the man would die,
And there an end; but now——"—*Macbeth.*

SIR,—I am much obliged to you for a sight of Dr. Griffin's very characteristic epistle; and, although it may seem even cruel in me any longer to expose the unavailing manœuvres of so palpably weak an individual, yet a regard for the best interests of society, which frequently require the punishment of an offence, though humanity feels for the agony of the offender, compels me reluctantly to perform this painful duty. In that spirit, then, I resume my task, with the honest conviction that, "to spare the rod would be to spoil the child," and perhaps permit this unfortunate pupil of mine to relapse once more into the hazardous pathway of "sham analysis" and "groundless assertion;" a calamity which I think I can prevent.

Under the influence of a train of sympathetic ideas easily to be comprehended, Dr. Griffin begins by a marvellously round-about allusion to Billingsgate, as if those [illegible] in such a word to the "ears polite" of the "outer barbarians" of his previous "no-other-sulphur-compound" communication. Now, for my part, I see no reason for this excessive delicacy, more especially since poor Tom Hood has been able to describe the locality as

"A place, the Muse unwilling
Recals for female slang and vulgar doing,
The famous gate of Billing,
That does not lead to 'cooing.'"

But, talking about Billingsgate, everybody knows that I am a plain-spoken man, and write very much as I talk, in the simple vernacular of this country; being quite satisfied if I can make myself understood by the great body of the British people. Unlike Dr. Griffin, I possess but little learning, and have, therefore, no "horns" nor "pendant *flocculi* transiently red-hot"—no "wanton and malignant falsehoods"—no "camelions" (chameleon?)—no "edge-tools" or "bungling hands" to "pin" people with. In truth, I labour under great disadvantages; and, if it should ever be requisite for me "*to assume the feelings and language of a gentleman*," it will be indispensably necessary that I should borrow for a time the "*impudent effrontery (for no other term will characterise it)*" that induced Dr. Griffin to make assertions with respect to certain "spotless martyrs," which he has neither the courage to substantiate nor the honesty to retract and apologise for in homely English fashion; but from the truthful discussion of which he cuts and shuffles with all the animal cunning of a Pee-Wit. No! mine is a most humble style of writing certainly, and compared with which Dr. Griffin's artistic labours are as "Hyperion to a satyr," or, more intelligibly, as "an Imperial Gas share to a Great Central one!" But then there is so much the less reason for our "green analyst" to get out of humour with me; he has all the advantage of his classical erudition, and evidently possesses a flow of language calculated not only to "fairly astonish Mr. Thompson," but even to put all Billingsgate "*hors de combat*" in a very short time. The curious fact, however, is, that with such amazing powers of rendering himself intelligible, he remains "silent as a tomb" upon the only topics of any interest in the present discussion; "a windlass and chain cable" could not draw him to a reconsideration of the "cheap-and-more-sulphurous-coal" story; the same machinery would fail to bring the "no other sulphur compounds in coal gas" again upon the "*tapis*;" whilst, as to the comparative "destruction of copper boilers by burning gas and coals," get it from "under his ventilating chimney" who can: at all events, I cannot.

In short, even the incrustation from the copper boiler has now resolved itself into an "efflorescence which had lain three months on a slate;" and it is quite as probable that the ½ per cent. of ammonia in it "had been taken from the air of the neighbouring laboratory (!) as that it had proceeded from the gas" (!!) though the sample examined for ammonia was "a fresh deposit (by the grace of the gas company), the other having been quite recently cleared away" (!!!) Yet, when I dwelt upon the "remarkable fact of a chemist conducting any gaseous experiment in the atmosphere of a laboratory," we were told that this had no connection with the boiler, which was "not in the laboratory;" still this "fresh deposit contained, more exactly, 449/000"—the last three cyphers being very expressive; and it must also have absorbed the whole of its water of crystallisation, for this ammonia result is quoted in connection with the previous analysis as a per centage result; from which we must conclude that "a fresh deposit" (by the grace of the gas company) is identical with something which "has lain on a slate for three months." Then, it appears, that if I "will take the trouble to pound some blue vitriol in a mortar, I will find that when finely divided it appears almost *white*." Now, being naturally of a most obliging disposition, I have "pounded some blue vitriol in a mortar," but, lo! it is still blue—a fine light blue! Let me add, with Hamlet, that, though Dr. Griffin may "*pound*,"

"or what he will,
To this complexion it must come at last."

At all events, it is neither "green" nor "greenish-white;" nor is there anything about it so "green" as the hope that this "feint" would help a "dubious analysis." I might follow Dr. Griffin through a variety of these Peewit movements to account for that which can only be accounted for on the simplest of principles, viz., that he never analysed anything, either from "a slate" or from "a boiler;" but, as I shall demonstrate this pretty conclusively towards the end of this communication, I will merely run rapidly through a few rather hardy misrepresentations, as specimens of what a Ph. D. can do when he is tightly pressed. I had given a brief extract from Berzelius, showing that sulphate of copper becomes "anhydrous and white at a temperature of 104° Fahr.," which now elicits from our anti-Billingsgate friend a fierce contradiction, and an allusion to the "perversion ingrained in Mr. Thompson's moral nature." Here is what Berzelius says upon the subject:—"*Ce sel contient* 36 *pour* 100 *d'eau dont l'oxygène est cinq fois celui de la base. A l'air chaud il s'effleurit, abandonne* 2/5 *de cette eau, et devient bleu clair. A* 40° (*centigrade*) *et au-dessus il perd peu à peu toute son eau, devient blanc, et se réduit en poudre au moindre contact.*" Which I translate as follows:—This salt (sulphate of copper) contains 36 per cent. of water, the oxygen of which is five times that of the base. In warm air it effloresces, abandons 2/5ths of this water, and becomes light blue. At 40° its water, becomes white, and [illegible] 104° Fahr. and above, it loses gradually all tact. Dumas, a tolerable authority, says of the sulphate of zinc:—"*Il s'effleurit lentement à l'air et devient opaque et blanchâtre. Exposé a l'action d'une chaleur douce, il peu perdre son eau de crystallisation sans se décomposer, et il passe alors à l'etat d'une poudre blanc bleuâtre.*" Which means, I believe, as follows:—It effloresces slowly in the air, and becomes opaque and whitish. Exposed to the action of a gentle heat, it can lose its water of crystallisation without decomposing, and then passes into the state of a blueish-white powder. The English translation of Gmelin, quoted by Dr. Griffin, says of it, "the crystals effloresce on the surface in dry air;" and Graham, another of Dr. Griffin's authorities, tells us, that at 212° Fahr. "it loses (not two, but) four atoms of its water of crystallisation, and that the remaining atom is expelled above 400°." It will be remembered that I merely attempted to quote Berzelius, without pretending to support so high an authority by any remarks of my own; and Dr. Griffin might as well have looked at the book before he rushed again into his hobby of "groundless assertion," in the declaration that "*Berzelius says no such thing.*" Has he so soon forgotten the "cheap coal perversion?" Dr. Griffin next assures us that "the tribasic sulphate of ammonia and copper does not decompose at the ordinary temperature of the air." Berzelius says of it:—"*A l'air ce sel se décompose peu à peu, exhale de l'ammoniaque, devient bleu clair,*" &c., which I translate:—In the air this salt decomposes itself little by little, exhales ammonia, becomes light blue, &c.; and there is scarcely a pharmacopœia in all Europe that does not allude to this notorious quality in the "ammoniuret of copper," as it is called; of which also Dr. Anthony Todd Thomson remarks, in his "London Dispensatory for 1833," "This preparation has the odour of ammonia, a hot styptic taste, and a rich blue colour. By exposure to the air, it parts gradually with ammonia, the blue colour is lost," &c.: so much for the "perversity of moral nature."

From the first moment I saw Dr. Griffin's "dubious analysis," I felt that it was a mere "pen-and-ink" affair, which a little careful treatment on my part would resolve into its original elements. There was, in fact, only one direction in which a "shuffle" could be effectual, and with this I was compelled to deal cautiously. Accordingly, my first efforts were directed to the singular absence of ammonia in the "dubious analysis," because a long experience in these matters had taught me that a copper boiler, under the circumstances alluded to by Dr. Griffin, gathers, after a time, a thin coating of sulphate of ammonia on the part immediately above the flame of the gas-burner, which sulphate adheres very tenaciously indeed, as may be seen by examining any of the copper kettles now so extensively used in hotels, coffee-houses, &c., to supply hot water at a moment's notice; of which kettles, by-the-by, I may remark, that the keeper of a respectable chop-house near Cornhill showed me a short time since one which had been used over a gas flame almost incessantly, night and day, for the last 22 years, and which, as he declared, "was still as good as when he bought it."

Again, the boiler which I employed so largely in my daily experiments upon the calorific power of the gases supplied to the City of London was made of copper, and many persons have seen me, for their instruction, pour over that exterior part of it which had been exposed to the flame, a little solution of caustic potash, by which an abundant evolution of ammonia was invariably produced; and, if more proof be wanting, I may mention that my friend Mr. Robert Warington, of the Apothecaries' Hall, told me long since that a thick plate of copper, which he kept constantly hot by a gas-flame as a kind of sand-bath, had contracted a closely-adhering crust upon its under surface, which consisted chiefly of sulphate of ammonia. Dr. Griffin's incrustation was, therefore, nothing new to me, however much I might be "fairly astonished" at his "dubious analysis" of it. Well, it turned out that Dr. Griffin, finding, on second thoughts, that he had got into a "mess," took the very course which plunged him inextri-

cably in the "mire" of duplicity; he acknowledged to the existence of a "leetle" ammonia in the incrustation, and gave a "per centage result," thus shutting himself out from the only available door of escape that remained open to him. That door consisted in the fact that, if the presumed sulphate of copper had been, as it ought to have been, anhydrous, the proportion of 32 to 32, given in the "dubious analysis," corresponded to 50 and 50—the actual result; and Dr. Griffin had only to say that he had reduced his result to the comparative proportion in the hydrated crystals, for the sake of illustration, and there was an end of the matter. But Fate decreed that Dr. Griffin should learn the pungent truth of Scott's well-known lines—

> Oh! what a tangled web we weave,
> When first we practise to deceive.

To show, as he fancied, my ignorance upon a subject which is particularly familiar to me, he declared the incrustation almost destitute of ammonia; and (in his own elegant Doric) "pinned" himself down to a per centage result, which left more than a third of the material operated upon unaccounted for! It may seem strange, but I really expected this, and in confidence told a friend so more than a month since. The result, sir, is now before your readers, in the form of a forlorn attempt by Dr. Griffin to get anhydrous sulphate of copper, which has been "transiently red hot," to absorb, under the ordinary circumstances of the atmosphere, more than one-third of its weight of water. With this view he quotes, as he says, "Gmelin" to show that the anhydrous sulphate of copper recovers the whole of its ammonia" gives the statement on the authority of some one named "Brandes," whose name he affixes to the statement, for the purpose of showing that he is himself not responsible for it; but, even admitting its correctness, what has this to do with the analysis, unless Dr. Griffin can show that he has "moist air" as well as gas laid on to his boiler? Are we to understand that the air of Bristol is always "moist," and that the "slate" is so far from the boiler as to be beyond the influence of the radiant heat from the boiler and from the gas flame? Oh! Desdemona, Desdemona! Oh! Oh!! Oh!!!

But the best, as usual, is reserved for the last. Dr. Griffin is in no way responsible for his "vipero-Iscariot" proceedings towards the "spotless martyrs." Dear innocent! he only believed them at a distance, having no idea that the calumny would ever be "made the subject of a leading article in the *Bristol Advertiser;*" and he is very anxious to show that it was so made "without the remotest connivance or knowledge on his part." I believe him most sincerely in these latter declarations; he neither expected the one nor desired the other; the limit of his wish was merely to "come it strong" in the *Pharmaceutical Journal*, without raising general attention: but I willingly draw a veil over the inevitable conclusion from the above facts, and trust that the lesson they inculcate will not be lost upon others. We have seen Dr. Griffin gradually abandon every point upon which he has tried to make a stand: the "increased bisulphuret of carbon," the "extra-impure and cheap coals," the "no-other-sulphur compound," the "extra-destruction of copper boilers by gas;" and now, even a drop of water from the atmosphere is denied him in his last extremity. Of a truth, there is a retributive justice at work in the affairs of this world, that, by unthought-of means, but with unerring hand, "commends the ingredients of the poisoned chalice" to the lips of its compounder. If, then, I might offer a word of advice to Dr. Griffin in connection with this matter, it would be, "Turn, young man, and retrace your steps whilst there is yet time, and believe not those innate promptings of your own heart which represent all mankind as selfishly dishonest. England has risen to her present enviable condition in the scale of nations, not by the superior talent, or courage, or industry of her sons, so much as by their practical application of the principles embraced in that well-known adage, 'Honesty is good policy:' think of this;" with which, for the present, I conclude.

Nov. 24, 1856. LEWIS THOMPSON.

NAPHTHALINE DEPOSITS.

SIR,—Having had many letters lately with respect to what the writers call *my* "Theory of Naphthaline Deposits," permit me to reply, in this public and summary manner, to these numerous correspondents.

In the first place, I have no "theory" upon the subject in question; and, in the second place, the circumstances that lead to the deposition of naphthaline are in reality nothing but a collection of well-known facts, upon which every thinking man can form an opinion, and draw a conclusion as easily and correctly as myself.

Thus it is well known that coal gas contains several kinds of hydro-carbon vapours, which condense at different temperatures, and therefore pass to the burners from the retorts in proportions varying with the temperature of the gas, which temperature is modified by that of the general atmosphere. If the atmospheric temperature be high, as in summer, the whole of these hydro-carbons find their way to the burner, and the mains, meters, and other portions of the gas apparatus are left clean; if, however, the atmospheric temperature be low, as in winter, many of these hydro-carbon vapours are condensed in the mains, meters, &c.; and more especially so at those points where the flow of the gas is slow, or where the mains, &c., are particularly exposed to the cooling power of the air. Now, as these hydro-carbons are condensed at different temperatures, it follows that during the prevalence of a medium or middle temperature, such as that of spring or autumn, the heavier hydro-carbons alone may condense, and the lighter ones pass on and remain in the gas. But naphthaline is the heaviest and most easily condensible of these hydro-carbons; and therefore we can have no difficulty in supposing that, during the prevalence of the middle or spring and autumn temperature, the refrigeration of the gas may be just enough to permit of the condensation of naphthaline, without, however, causing the condensation of the next hydro-carbon, which is naphtha. Under these circumstances, the condensation of naphthaline in the gas will take place, in its usual form of fine light scales, that float in the gas for a great distance, like fine snow, as may be seen by sublimating a little naphthaline in the open air.

The naphthaline will, therefore, present in the gas the same conditions as to deposition that snow exhibits in the air; that is, it will drift or collect in eddies or other places where the current of the gas is checked or diminished. Every person must have noticed that, if a cloud of dust or snow is driven up a street which is intersected by another street, a drift or deposit takes place immediately around the corner of the intersecting street: this corresponds to a bend in a gas-main, where, as is well known, naphthaline often presents itself. Again, if a narrow tube terminates in a wider one, so as to diminish the velocity of the current of gas, deposition will take place; and this is sometimes seen in the termination of a small service-pipe in a large meter. It is useless to multiply examples and instances—the deposition of mud in a river embraces the whole question.

But now with regard to the existence of a temperature sufficient to condense both the naphtha and naphthaline: in this case the naphthaline does not crystallise, but is thrown down with the naphtha as a fluid, like rain, and therefore flows off into the syphons, or very slightly obstructs the passage of the gas by occupying the least space possible, and presenting the least surface for friction. Hence we deduce a practical corollary to the effect that, if during the prevalence of a middle temperature, naphthaline begins to show itself, we must surcharge the gas with naphtha vapour, so as to throw down, even at that temperature, a fluid compound consisting of naphtha and naphthaline; or, in other words, produce artificially, in spring and autumn, the conditions natural to winter: for this purpose a few charges of cannel coal are needed whenever naphthaline becomes troublesome. There is, I believe, no "theory" in this, if I have had the good fortune to make myself intelligible.

Theoretically, however, it is possible, as naphthaline is a powerfully negative-electric, that the friction produced by the gas in travelling through a dry main, may sometimes excite its powers in this respect, and cause it to deposit itself on any *positively* electrified surface in preference to every other locality. Something of this kind may occasionally prevail, and I almost fancy I have seen cases of it; but I have nothing decisive to offer in the way of information upon this head, nor is it practically of much importance: a charge or two of cannel coal, or, technically speaking, a drop out of the "brandy bottle," is a sure anti-electric, as well as a remedy "against cold:" in both cases, however, it is advisable to diminish the power of the condenser. This is all I know at present about naphthaline deposits. LEWIS THOMPSON.

M. JEANNENEY'S PHOTOMETRICAL OBSERVATIONS.

SIR,—Mr. Lewis Thompson has certainly too much of the spirit of witicism for me; and, therefore, I shall not attempt to follow him in that respect.

Unfortunately, too, my subject is not one calculated for laughter, since it implies the discussion of a theory to which Mr. Thompson's answers have been so singular, that I am unable to say whether that gentleman cannot, or knows not how, or will not, reply, to my theory.

Mulhouse, Nov. 7, 1856. J. JEANNENEY.

SIR,—I am much obliged to you for a sight of M. Jeanneney's letter, which, however, leaves me very much in the state it found me. M. Jeanneney appears to be in doubt as to whether *I cannot*, or *know not how*, or *will not*, reply to his theory. Now, those who are acquainted with me will tell M. Jeanneney that I am always most happy to reply to any one; therefore I hope he will take my courtesy in this matter for granted, and permit me to say, that I *cannot* reply to his theory, for the simple reason, that I have no idea what his theory is, and I fear the great bulk of your readers labour under the same disadvantage. LEWIS THOMPSON.

Register of New Patents.

1007.—GEORGE NAPIER, of Bath Street, Glasgow, and Adelphi, in the co. of Middlesex, and JOHN MILLAR, of Cavendish Street, Glasgow, for "*Improvements in the manufacture of gas from coal tar, or other bituminous, resinous, or fatty matter.*" Provisional protection only obtained. Dated April 28, 1856.

These improvements relate to a method of introducing coal tar, or other bituminous, resinous, or fatty matters, into the retorts, whereby the evolution of gas therefrom is facilitated; which gas is also of improved

illuminating power, and void of deleterious and incombustible compounds, and the manufacture is conducted with little or no residuum in the retort. A number of retorts are provided, and are placed in communication with a main pipe, to convey the gas as usual. These retorts are also in communication with another pipe, to supply the coal tar, or other resinous or bituminous matters, which are kept in a heated state, in order that they may have sufficient fluidity for the purpose. A force-pump is in communication with the supply-pipe, and placed between the reservoirs and the retorts, whereby the fluid matter is forcibly injected into the retorts through suitable jet apertures, which distribute these matters over the interior surface of the retort. The retorts being kept in a heated state suitable for the conversion of these matters into gas, the whole injected matter is immediately converted into gas, and passes off through the main pipe by its generated pressure in the retort. Sufficient time having elapsed to allow the greater portion of the gas to pass away from the retort, the injection of the matter is repeated, and so on, an almost continuous evolution of gas from the matter so injected takes place. Instead of injecting into a number of retorts by one force-pump, it is better that each retort be provided with a separate pump or injecting chamber, in order that the injected matters may be separately measured, and injected with certainty into the respective retorts, which would not be strictly the case where one pump supplies a number of retorts.

1028.—Nathan Defries, of Fitzroy Square, and George Bachhoffner, of Montague Street, London, for "*Improvements in gas fires.*" Patent dated May 1, 1856.

This invention of improvements in gas fires consists—first, in forming the gas burner or jets, used for such fires, of argillaceous material mixed with oxide of copper, or other metallic oxides or metals, in a finely-divided state, which imparts a hardness to the argillaceous material, and renders it more durable for the purpose; and also has this advantage—that it produces a burner of a dark or black colour, which, if of a suitable shape, gives it the appearance of coals.

The compound of argillaceous matter and metallic oxides or metals is also formed into small thin masses or layers, having one or more openings through them, and over which openings are placed threads or films of asbestos, where they are caused to adhere while the argillaceous matter is in a moist state.

These layers of argillaceous matter, thus composed, are placed above each other over the burners emitting the gas, which, in its emission and ignition, causes the whole mass to become ignited or red hot, and thus represents much the same appearance as a coal fire.

This invention refers to an improved formation and arrangement of the burners for gas fires, which is further applicable to the arrangement of gas fires previously patented by the same parties (patent dated December 19, 1850), and, also, in the nature and preparation of the non-combustible matter employed to give the appearance of a bright coal fire, gas alone being the combustible agent.

In the construction of gas-burners for this purpose, the well-known substance called potter's clay is employed, in a state or condition similar to that employed by the potter in the fabrication of ordinary pottery; or the description of clays commonly known as pipe-clay and fire-clay. With either kind of clay is mixed from 10 to 15 per cent. (more or less) of any metallic oxide or borings of iron or other metal, in a finely divided state, not fusible at a red heat—such as the black oxide of manganese, the black oxide of copper, the per or sesqui oxide of iron, the metal platinum, in a minute state of division, commonly known as spongy platinum, or the substance known as plumbago or black-lead, or it may be iron borings or filings. For these purposes, preference is given to the black oxide of copper, as it remains unchanged in colour when mixed with the clay, after being exposed for a length of time to the action of the gas flame, while it gives to the clay the firmness and consistency of a metallic substance, and, at the same time, affording it a closer and better resemblance to ordinary coal. The metallic oxide is kneaded up with the clay, and when well incorporated, the burners are formed with it. The mode of making the burners is as follows:—

Having taken a pattern of the fire-grate into which the burner is to be fitted, the clay, while in a plastic state, is moulded in two or more pieces upon the said pattern; the mould, or core, is then removed, and the several pieces are united in the ordinary way, so as to form a hollow mass. A hole is then made beneath for the admission of gas and the attachment of the gas pipe. In the upper surface, and towards that portion of the burner which is to form the front of the fire, and from which the gas to be ignited is to issue, fine holes are pierced, drilled, or moulded for this emission. The burner thus prepared is then dried and fired in the kiln, as now practised for ordinary pottery-ware.

Instead of a burner of this description, the patentees sometimes use hollow bars of the prepared clay, which bars may be so formed as to coincide with the bars of the fire-grate. Holes are drilled or moulded in these bars for the escape of the gas in manner similar to the iron bars now employed for that purpose. Other shapes and arrangements of burners may be formed of clay combined with oxides of metals, or metals in a finely divided state, as before described, suited and adapted for the purposes for which they are required.

The same combination of clay and oxides of metals, or metals as hereinbefore described, are used in the formation of thin lamina, in pieces of an area from about 1 to 16 square inches, and of about $\frac{1}{4}$th to $\frac{1}{12}$th of an inch in thickness, more or less. While in a plastic state, holes or perforations are made through such pieces by preference, without regularity or order of position. Over these holes, films or strips of asbestos are placed, and caused to adhere while the clay is yet in a plastic state, and to which the asbestos adheres when the lamina or thin masses of clay are baked and fired, or burned in a kiln, as before described. The plates or laminæ of clay are moulded of a convexo-concave form, so that gas, on being admitted below and under the curved side, will pass up through the holes, and will impinge on and pass through and amongst the films of asbestos in an ignited state.

In any suitable fire-place or position the burner is placed, from which the gas is emitted. Superposed on this is placed several layers, or pieces of clay, as before-mentioned, with the concave side downwards, so that the gas, when emitted and lighted, passes up through several layers, or laminæ, of the clay and asbestos. Immediately the gas is lighted, the asbestos presents a bright luminous appearance, while the clay presents, more or less, the appearance of black coals. After the gas has been lighted some little time, it gradually becomes red hot, and will become, more or less, or entirely so, according to the quantity of gas consumed, in proportion to the extent and arrangement of the clay; any part remaining dark or black, resembling in some degree the black coals of a fire.

The several parts manufactured, as hereinbefore described, are applicable, and may be arranged and applied in the manner of the gas-fires, described in the specification of the former patent, already referred to.

The patentees do *not* claim the exclusive use of clay, or other argillaceous materials, or asbestos alone, in or as part of gas-fires, or as gas-burners for those fires; but they do claim the combination of metallic oxides or metals, as above-mentioned, with clay, or argillaceous materials, in the manufacture of gas-burners, or the bars of gas-fires.

They also claim the combination and arrangement of films of albestos with the layers or masses of clay, as above described.

1033.—Richard Archibald Brooman, of 166, Fleet Street, in the City of London, for "*Improvements in compressing, regulating the pressure and flow of, and for conveying gas; parts of which are applicable to air and other fluid pumps.*" A communication from P. Hugon, of Paris. Patent dated May 1, 1856.

This invention consists—

1. Of an improved pump for compressing gases, together with its appendages; applicable also for air and other fluids.
2. Of an improved tap or cock.
3. Of a regulating apparatus.
4. Of an apparatus for the conveyance of gas.

The improved pump for compressing gas and other fluids consists of a pump barrel, with a piston on the end of a hollow trunk, which forms the piston-rod. An annular space is provided between the trunk and the barrell, and leathern and metallic or other suitable packings are inserted round the cover of the barrel, and round the piston, to prevent the escape of gas. The pump has three valves, of a peculiar construction; one, the inlet-valve, which is in the bottom of the barrel; another in the piston opening into channels leading into the annular spaces between the trunk, or piston-rod, and the pump-barrel; and a third, or outlet-valve, at the side and near the top of the barrel, for the exit of the compressed gas. The first two valves open inwards, and the third outwards. They are fitted in such a manner as to be removed if required for repair, or otherwise, without disturbing the other parts of the apparatus, and they are so constructed as to close hermetically. Each consists of a plug, or closing piece, hollowed out on the under side, and brought to a sharp edge, which fits hermetically in a metal seat. The packings are so fitted as to wear for a long time without having to be removed for repairs.

The drawings attached to the specification represent a sectional elevation of a pump constructed according to the present invention. The pump barrel is fitted with a piston, or plunger, at the end of a hollow trunk, or piston-rod, to which reciprocating motion is communicated by means of a steam-engine, or otherwise. There is a gland or covering for the barrel fitting into a cylindrical recess, and acting as a guide for the piston-rod. This gland bears against the leathern or other fixible washer or packing, which keeps that part of the apparatus gas or fluid tight. The end of the piston-rod is screwed into a cap, which forms the outer part of piston. This cap fits over a washer or packing, and, the piston and trunk being thus arranged at top and bottom, any lateral play of the piston is prevented.

The valves above referred to are constructed in the following manner: Each valve has a cylindrical seat, turned true on the inside, in which works a steel plug, or closing piece, hollowed out on the under side, and in a piece with the valve proper; and the closing piece is perforated with small holes for the passage of the gas. The valve is conical, and fits in the seat, which is cut to a sharp edge, to form a tight joint. The valves are also furnished with springs, for closing them rapidly. The spring for the valve proper is a steel plate having an orifice in the centre, through which a screw passes, secured by a nut, and the ends of the spring are held in a groove formed to receive them in the pump barrel. The piston in the valve, and the inside of the piston, are also furnished with springs. These three valves are so fitted that they may be easily removed and replaced when required. The seat of the inlet-valve is fixed by a nut to the base or sole plate which supports the pump, and is kept gas-tight at that part of the packing. The seat of the valve in the piston is secured by means of an annular screw, and also kept gas-tight by a packing; and the exit-valve is mounted on the socket, which is screwed on to the pump barrel.

The action of the pump is as follows:—Supposing gas to have been admitted into the pump-barrel through the inlet-valve, when the piston descends, the gas contained in the lower part of the barrel will be compressed, and will close this valve and open the valve in the piston. The gas will then pass through the channels into the annular spaces, and will be compressed therein, the pressure being in proportion to the difference between the capacity of the barrel and that of the spaces. On the piston commencing its upward stroke it closes the value, and as the space in the annular chamber gradually becomes lessened or filled up by the piston as it rises, the degree to which the gas is consequently compressed increases until this pressure overcomes that at which the outlet-valve has been weighted, when it will open that valve and flow through into a receiver. Immediately on the piston commencing its up-stroke, the piston-valve will be closed, and a vacuum being produced below it, the inlet-valve will be raised or opened, and will thus admit a further supply of gas into the pump. As the piston performs its down-stroke, the compressed gas that has passed out into the receiver will shut the exit-valve, and close itself off from re-entering the pump-barrel.

When this pump is applied for compressing gas for lighting purposes, the gas, before entering it, is carried through a gasometer, which is made to descend when the issue of gas slackens or ceases, in order that the attendant may know when to slacken or stop the pump, and so prevent any air being sucked in. The gas is also made to pass through a cylindrical receiver before entering the pump. This receiver is furnished with an inlet tap or valve, and with an upright glass tube leading into a vessel con-

taining coloured water. The degree of suction or pressure in the pump is ascertained by closing the inlet-tap of the cylindrical receiver (so that the pump may only draw in the gas contained therein), and noting the height to which the water rises in the tube. When the piston descends, if the lower valve closes tightly, the water should remain at the same height in the tube, so that, by this means, it may be ascertained if either, and which of the valves, is out of order. The piston trunk working within covers or caps at the top and bottom, the packings or flexible washers are not put out of shape or thrown out of order by the lateral play of the piston.

2. The invention consists of an improved tap or cock, fitted with a conical or sharp-edged plug for opening and closing the fluid-way, and acted on by a key which bears against the plug, but is not in a piece with it. To close the tap, the handle of the cock is turned until the plug is pushed into a seat in the fluid-way, between the inlet and outlet orifices. To open the tap, the handle is turned back, and a spring pushes the plug out of its seat. Packing, fitted in a cap or socket, is provided at the part where the handle passes out, to prevent an escape of gas therefrom. This packing consists of washers of leather, gutta percha, or other like material. To effect a tight joint between the nose of the tap and the pipe or tube to which it has to be connected, the following arrangement is adopted:—Into the opening through which the gas escapes, a short tube is fitted, which extends a little beyond the nose of the tap, and enters into a socket, into which is soldered the pipe or tube into which the gas is to be conveyed, and which, by means of a screw, is tightly screwed up against the face of the tube. There is a recess cut in the face, in which melted tin or other soft metal may be poured, for greater security. This mode of junction prevents any internal leakage, and facilitates the regular and easy flow of gas.

3. The invention consists of an improved regulator or apparatus for regulating the flow of gas or other aëriform fluid. This regulator consists of a receiver or vessel of a peculiar form floating in water in such a manner as to oscillate or vibrate as if on an axis, and furnished with arms connected with a friction roller, which acts on a plug fitted in the passage through which the gas enters, and which, according as the receiver rises or falls, wholly or partially opens or closes the inflow of gas. One of the arms or levers is centred on a fulcrum terminating at the end in a fork, which carries a friction-roller centred in the fork a little above the fulcrum of the arm. As the receiver rises, this arm rises with it, and shifts the end of the lever, which brings the roller against the back end of a plug working in a cylindrical socket in such a manner as to push it forward into an opening prepared for it, and so as to close the inflow of gas wholly or partially. On the other hand, when the receiver decends, the rollar is brought away from the plug, while the spring round it, being released from pressure, pushes the plug back, and opens the passage for the inflow of gas. As a greater quantity of gas is consumed, the receiver decends, and the gas inlet is opened more widely, while in the contrary case the receiver rises and closes the opening either wholly or partially. The gas issues from the regulator for consumption at a pressure indicated by the weight of the receiver added to that of the arms and rods. The advantage of the gentle oscillating play of the regulator is this, that a continuous flow and regular rate of pressure is maintained. To increase the pressure, the weight of the receiver must be increased.

4. The invention consists of a cart or apparatus for the conveyance of gas. This apparatus is a vehicle containing a number of cylindrical vessels, each communicating separately with a rail, gallery, or common pipe at the back of the carriage, provided with as many tubes as there are cylindrical vessels, so that the supply may be cut off from each vessel separately. The rail is provided with a manometer, to indicate the degree of pressure of gas in the receiver of any particular consumer; each tube is opened successively until the desired degree of pressure is arrived at. The pressure in each cylinder is independent of that in the others. Gas is conveyed from the cart to the consumer's private receiver through a strong caoutchouc or other flexible pipe or hose.

In this arrangement, each cylinder being separately connected to a general tube, or gallery, if one should happen to leak, the gas in that particular cylinder only will escape.

The claims are for—

1. The general construction and combination of the parts and method of action of the improved pump and its appendages for compressing gas and other fluids, as described above, and represented in the drawings attached.

2. The construction, method of action, and arrangement of valves, hereinbefore described.

3. The arrangement for regulating the flow of gas, and the action of the pump, with reference to gas for lighting purposes, as described.

4. The construction, arrangement, and method of action of the tap or cock, especially so far as relates to the method of closing the tap by means of a sharp-edged conical plug, separate from the handle or key of the tap, and the employment of a cap or socket to receive the flexible packing, as described.

5. The construction, arrangement, and method of action of the regulating apparatus, as respects the receiver; and the mode of regulating the inflow by means of an arm or lever and friction-roller.

6. The construction and arrangement of a cart, or apparatus, for the conveyance of gas.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED PATENTS.

2583.—JOHN KIRKHAM, of Tonbridge Place, New Road, London, civil engineer, for "*Improvements in the construction of furnaces, ovens, or kilns for drying, baking, or burning pottery, earthenware, bricks, tiles, or other similar articles, and in the means of collecting and condensing the smoke, gases, or vapours evolved from the fuel in such other furnaces or fireplaces, or that escapes from the retorts and other parts of the apparatus used in the manufacture of gas.*" Nov. 3, 1856.

2597.—JAMES FERNIHOUGH, of Dukinfield, in the co. of Chester, boilermaker and ironfounder, and ROBERT FARROW, of Leek, in the co. of Stafford, engineer, for "*A self-acting apparatus for regulating the supply of atmospheric air to furnaces, gas stoves, and other closed vessels used for the consumption of fuel or combustible gases, by preventing the formation of smoke therefrom, and thereby economising such fuel or combustible gases.*" Nov. 5, 1856.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED PATENTS.

1665.—JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, London, and 166, Buchanan Street, Glasgow, N.B., gentleman, for "*Improvements in apparatus for consuming smoke, to be applied to lamps and gas-burners.*" July 15, 1856.

1794.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, London, civil engineer, for "*Certain improvements in the process of generating illuminating gas.*" July 29, 1856.

2266.—WILLIAM SMITH, of Skinner Street, London, and NATHANIEL FORTESQUE TAYLOR, of Stratford, Essex, gas engineers, for "*Improvements in apparatus for measuring gas and other fluids, and in regulating the flow of the same.*" Sept. 27, 1856.

2349.—WILLIAM MARRIOTT and DAVID SUGDEN, of Huddersfield, in the co. of York, agricultural chemists, for "*An improvement in purifying coal gas.*" Oct. 7, 1856.

Miscellaneous News.

THE METROPOLITAN BOARD OF WORKS.

WEDNESDAY, NOV. 12.

An Adjourned General Meeting of the Board was held this day, in the Council Chamber, Guildhall—Mr. THWAITES in the chair.

The minutes were read and approved.

OFFICES OF THE BOARD.

Mr. SEELEY brought up a report from the committee on the site of offices, which was read by the clerk. It stated that since the 10th of October, when the last report of the committee was brought up, the subject of a convenient site for the offices of the board had continued to engage their attention; and they had reason to believe that it might be practicable, on proper application being made for that purpose, to obtain on suitable terms a portion of the site of the former Fleet Prison; and they accordingly recommended that the committee be authorised to treat with the corporation of the City of London for a portion of the site of the former Fleet Prison, in Farringdon Street, as a site for the offices of the board.

Mr. SEELEY, in moving the adoption of the report, said the committee thought the spot a very desirable one, and they had ascertained that a portion of it could be secured; but, as the practice of the corporation in letting City lands was to receive tenders, and not to offer terms, it would be necessary to authorise the committee to take that course, subject, of course, to the approval of the board.

Mr. DIXON seconded and Mr. SNOW supported the motion.

Mr. LESLIE objected to the adoption of the report, and repeated his former arguments in favour of the Greek Street premises.

Mr. H. L. TAYLOR said, the last speaker felt strongly in reference to Greek Street, as it was his "first love;" and he seemed desirous that this board should remain in the same state of inactivity as the old commissions with which he was for so many years identified. But the board had already decided that they would not go to Greek Street; and therefore to revive a discussion on that subject was useless, and a perfect waste of time. The resolution now submitted did not pledge the board to accept the tender which the committee might make to the corporation; it simply authorised the former to negotiate for a site, subject to approval.

Mr. HOWS hoped the committee would not have the power asked for, as the board, by granting it, woud give up the whole question.

Mr. BIDGOOD agreed that it would be very imprudent to give such powers to the committee. What the board might want in another seven years it was impossible to say, but at present they did not stand sufficiently secure in their position to warrant any large outlay. He was in favour of a moderate sum being expended, to provide temporary accommodation in Greek Street.

Mr. BURSLEM said, although he did not object to going to any part of London in the discharge of his duty, yet he did object to laying out a large sum of money upon leasehold ground, when they had freehold premises of their own which might be adapted to their purpose. He did not sympathise with those who regarded the board as an ephemeral institution; and he hoped that, whatever was done in the way of alterations at Greek Street, would be of a substantial and permanent character.

Mr. BRISTOW said, if the adoption of the resolution was simply to empower the committee to negotiate, he would not object to it; but he felt that they would be pledged by the offer which the committee might make. At all events, the terms of the tender should be first settled by the board.

Mr. DALTON justified the course which the committee had taken in bringing up this recommendation, which was quite in consonance with the instructions they had received. They believed that Farringdon Street was as near as possible to the centre of the jurisdiction of the board, and that it was accessible from all parts of the metropolis.

Deputy HARRISON said, honourable members need be under no apprehension as to the results of the sought-for negotiation, as the City lands' committee would have no more power to conclude a treaty for purchase than the committee of this board. The former could only receive tenders, and recommend them to the acceptance of the corporation; and the latter were by act of Parliament precluded from determining any question without the concurrence of the board.

Mr. TURNER felt that, whatever alteration might be made at Greek Street, there would never be sufficient accommodation; and therefore, though the most convenient in point of distance for him, he had always voted against it.

The discussion was continued for some time, in the course of which Mr. Crellin, Mr. Offor, Mr. Dixon, Mr. Hawkes, Mr. Doulton, and others, addressed the board. In reply to some remarks made by Mr. Doulton,

The CHAIRMAN said, there had never been any substantive motion condemning Greek Street, but there had been several resolutions directing inquiries as to other sites; and the fair inference from these was, that the board were not satisfied with that locality.

Mr. WRIGHT said that, though he believed the board was a permanent one, and that, though in point of accommodation and geographical position Greek Street was not a desirable place for their meetings, he felt that the present motion was premature. The board ought first to make for themselves a character, and thus entitle themselves in the eyes of their constituents to expend a considerable sum in providing suitable premises for their operations. He objected also to building upon leasehold ground in a comparitively insignificant neighbourhood, when before long they would have noble sites offering in some of the new thoroughfares which they were laying out. Under this impression, he would move that this discussion be adjourned for six months.

Mr. HAWKES seconded the amendment. If the evil day must come, let it at all events be postponed as long as possible.

Alderman CUBITT said he hoped there would be no more delay in this matter. It was one of the reproaches of this board—and he was hearing of it continually—that they were always talking, and never doing. It seemed to him to be an established fact that the board would be a permanent one; and he believed they had a prodigious work to do, and must spend an enormous amount of money. In carrying out the object for which they were created a board, it was desirable that the utmost facility of access to, and accommodation in, the premises they occupied should be secured; and even the "convenience" of the members must not be lost sight of, for upon that depended very much their efficiency for public duty. He was as satisfied as he could be that, if they had the seat of their government in Greek Street, the business never could be done well by those parties who were best calculated to do it. The best spot they could select would be the centre of variation and divergence of the omnibus traffic; and, though Farringdon Street did not entirely answer that requirement, yet it appeared the best that had been proposed; therefore he would like to see the committee empowered to treat for it. As one of the City lands' committee, he would take care that full justice should be done on that side; and, as to the objection which had been raised to the tenure of the property, he had no doubt, if it were made a *sine qua non*, the freehold could be purchased.

Mr. SEELEY replied: The board were most unfortunately situated, and he believed no public body ever had so pestiferous a legacy left them as they had in the Greek Street premises. He was convinced that, if it was desired to ruin their efficiency, they could not do better than take up their quarters there.

The question was then put, and a division taken, when there appeared—

For the amendment	.. 12
Against it	.. 23
Majority against	.. — 11
For the motion	.. 22
Against it	.. 14
Majority for	.. — 8

FINANCE.

The board then proceeded to receive a report on state of collection of district sewers' rates for the month of October, 1856; also to receive report on state of collection of charges for default and improvement rates for the same month; to allow deficiencies on district sewers' rates; and to seal improvement rates made on the 27th ult.

It was reported that a sum amounting to £11,387. 2s. 10d. was uncollected on the district sewers' rates, and £5895. 18s. 2d. on charges for default and improvement rates to the end of October.

THE TOLL-PAYING BRIDGES.

A report from the finance committee was brought up and read. It stated that, in the opinion of the committee, the only practicable way of throwing open Southwark and Waterloo Bridges is by purchasing the interest of the proprietors; and that, before taking any further steps for such purpose, and inasmuch as the committee have ascertained that the corporation of the City of London have been in negotiation for the purchase of one of the bridges—viz., Southwark Bridge—the committee request the authority of the board to place themselves in communication with the corporation, with the view of learning whether they are prepared to purchase, or to join in the purchase of, such bridge.

Deputy HARRISON moved, and Mr. HOWS seconded, the adoption of the report.

Mr. BEVEN said that he did not believe any benefit could arise from the opening of these bridges to the district of Bethnal Green, which he represented, as it was situated at a considerable distance from either. He felt bound, therefore, to protest against any proposition by which his constituents would be taxed for an improvement only to the City and Southwark. Already it had been determined that upwards of £300,000 should be expended in the construction of a new street in Southwark, and he thought it behoved honourable members to pay some attention to the requirements of their own localities. As regarded Southwark Bridge, it certainly ought to be considered in the light of a special improvement for the borough and the City of London, and the cost of its being thrown open should be apportioned accordingly.

Mr. D'IFFANGER argued that, because the present traffic over Southwark Bridge was very small, it would be comparatively useless to remove the tolls. At the same time he approved of the recommendation, to confer with the corporation on the subject.

Mr. H. L. TAYLOR said he believed the City would be prepared to do its duty in this matter; and there could be no doubt of the great advantage which throwing open this bridge would be to the traffic of the metropolis generally. The question, however, was one of difficulty, inasmuch as they had to consider the price to be given for a bridge which, to all but those who were shut out from it, was nearly worthless. The position of the affair was this, that the bridge had been built at a large cost, and the original shareholders to this hour had never received one farthing. Afterwards money was advanced by preference shareholders, who were guaranteed 10 per cent. when it would pay them; but as yet they had only received 1½ per cent. If the bridge were a paying property, there would be no difficulty in getting at the value of it; as it was, although a ruinous speculation, the shareholders wanted to be recouped the whole of the amount expended upon it. To secure the bridge, therefore, at a fair price, it would be necessary to go to Parliament under the powers given to them by the legislature; and, in doing so, the corporation would, he believed, be prepared to join them.

Mr. BIDGOOD saw no objection to making the inquiry; but he hoped it would not go forth to the world that this board were willing to incur the monstrous expense of £300,000 for a bridge which, except for foot passengers and light traffic, could never be made of the least use.

Mr. LESLIE objected to the motion. The City of London had for years been trying to get hold of Southwark Bridge, and had failed; and he strongly protested against this board being "hooked" into any negotiations for the purchase of it. The bridge was like Punch's railway—it came from nowhere and it led nowhere; the approaches on either side were most inconvenient, and, without enormous expense, could not be available for any but the lightest traffic.

Mr. COLLINSON denied the statements just made. The bridge led from the very heart of the City to the whole of the southern suburbs of the metropolis. The opening of a free communication across it was not a local but a general improvement; in fact, it was one of the wants of the metropolis, and the relief it would afford to the traffic of London Bridge no one could, at the present time, properly estimate.

Mr. WARE supported the motion. The fact of its being a toll-paying bridge, although the toll might be very small, caused its entire disuse; and the consequence was, that it led to the over-working of horses, and a vast amount of delay and inconvenience in going a long way round to avoid it.

Deputy HARRISON, in reply, said that the resolution he had submitted was one of a most simple character, as it merely asked for the permission of the board to place themselves in communication with the corporation in respect to the purchase of Southwark Bridge, which had been described as worthless property. The City of London, some years ago, moved in this matter, but had no sooner done so than up started a railway company, and, for the sake of having a terminus in the City, offered a sum of £300,000; but no further steps had been taken by the railway company, and the bridge company had since refused to listen to any proposition short of £300,000. It was with no intention to pay such a price for it that he now brought forward this motion. If the parties were not prepared to accept a reasonable offer, it would be the duty of the board to go to Parliament and obtain powers to purchase upon a fair assessment of the dividends now being received by them. The reason why the City did not now take it up was, that the Metropolis Local Management Act had deprived them of the power to do so by themselves; but they were quite prepared to do so in concert with this board.

The resolution was adopted by a majority of 21 to 3, and the report referred back to the committee to carry into effect.

ENGINEER'S REPORTS.

Mr. BAZALGETTE brought up his reports on works proposed to be executed by the vestry of Lambeth for the repair of footpaths, &c., on trust roads within the parish, and for payment of which the vestry apply for permission to borrow the sum of £4500, on the security of the rates; also on applications from vestries and district boards to construct sewers in Riding House Lane, Great Cumberland Mews, and Adam and Eve Court, Marylebone parish; Wellington Street, Bromley, Poplar district; intended new street near Warwick Road, Kensington Parish; Denmark Hill, opposite Cold Harbour Lane, Camberwell parish; and Grosvenor Street, Wharf Road, City Road; St. John Street, Packington Street, Queen's Head Lane; Great William Street, and proposed roads on the Randell Estate, Maiden Lane, Islington parish.

The necessary orders were made thereon, and several miscellaneous reports disposed of.

ADJOURNMENT OF THE BOARD.

On the motion for the reading of the reports of the superintending architect, Mr. BRISTOW said, he deemed that this was a proper time to move that the whole of the architect's reports be postponed until Tuesday next, and then to be heard at Greek Street, as the reading of these reports occupied the time of the board, which was required for more important objects.

Mr. SAVAGE opposed the motion.

Mr. SEELEY said, it was quite evident that the present system could not go on, and therefore he most cordially supported the motion before the chair.

Mr. H. L. TAYLOR hoped his friend Mr. Bristow would not play into the hands of those who were continually tormenting them to go to that wretched place in Greek Street; and, as he believed he had no particular desire to go there, he should move, as an amendment, that a meeting take place on Tuesday next, for the purpose of disposing of the architect's reports, and that such meeting be held at Guildhall.

After considerable discussion, the motion was adopted.

REJECTION OF THE MAIN DRAINAGE SCHEME BY SIR B. HALL.

The CHAIRMAN said he had a very important communication to lay before the board, which Mr. Woolrych would now read.

The CLERK read the following letter:—

Office of Works, Nov., 1856.

Sir,—I am directed by the First Commissioner of her Majesty's Works, &c., to say that he has considered the plans of the main drainage of the metropolis submitted to him by a deputation of the board on Wednesday last, in relation to the outfall proposed at a point marked B on the plan, which point on the south side, according to the plan, is about one mile from the eastern boundary of the metropolitan area, and about 2¼ miles west of Erith.

The First Commissioner desires me again to refer the board to the words of the act 18 & 19 Vict., c. 120, which are as follow:—"And such board (the Metropolitan Board of Works) shall make such sewers and works as they may think necessary for preventing all or any part of the sewerage of the metropolis from flowing or passing into the River Thames in or near the metropolis, and shall cause such other sewers and works to be completed on or before the 31st day of December, 1860."

He conceives that the plan presented to him, in regard to the outfall, is at variance with the intentions of the Legislature, and contrary to the spirit of the statute. It is, therefore, with much regret that he feels bound to return the plan, withholding his approval. The First Commissioner further desires me to state, that he finds by the authorised proceedings of the board, that the same outfall at B has been several times under their consideration. It appears, at page 346 of those proceedings, that an outfall in Erith Marshes has been proposed by the engineer, in a report presented to the board on the 7th of July; and that, after this proposition had been in the hands of the members of the board for about fourteen days, it was moved, on the 22nd of July, "That the outfall in Erith Marshes, as proposed by the engineer in his report of the 7th of July, be adopted, and that the discharge take place only at or after high water." To this an amendment was moved, "That the engineer be directed to prepare sections and estimates for extending the main outfall sewer on the southern side to a point in Long Reach below Erith, and so as to be discharged at and after high water only."

This amendment was carried, thus negativing, or at all events postponing, for further information, the plan of the engineer for an outfall at Erith Marshes, as embodied in the original motion. On the 12th of August it was again considered, when, after various motions of different kinds in relation to the main drainage had been put and negatived, an amendment was moved, "That the discharge of the main outfall sewer on the south side of the Thames be made at a point in the River Thames on the Surrey side westward of Erith." This amendment was negatived, and it was subsequently resolved, "That the report of the engineer be referred back to him, in order that he may report to the board on the whole question of the northern and southern drainage of the metropolis."

The subject was again brought before the board on Monday, the 6th of October last, by a motion to the following effect:—"That the resolution of the board of the 12th of August, 1856, negativing the following amendment—namely, 'That the discharge of the main outfall sewer, on the south side of the Thames, be made at a point in the River Thames on the Surrey side westward of Erith,' be revoked, with a view to the consideration of all, and the adoption of either, of the several systems of drainage set forth in the engineer's report of the 25th of September, 1856." This motion was carried unanimously. The board were by this time in possession of the report of the engineer. They were also in possession of the opinion of their legal adviser upon the subject of the outfall at B; and, having rescinded all their previous resolutions which prevented them from reconsidering the outfall, they were now in a position to discuss every point of outfall, and determine that most important question. Being placed in this position, the first motion brought before the board (v. p. 509, Oct. 6, 1856) was the following:—"That the engineer's report, so far as relates to the outfall at B on the plan, be adopted." Amendments were moved, which were negatived, and the original motion, in regard to the outfall at B, was rejected. It therefore appears that at every time and on every occasion, up to the 6th of October last inclusive, when this plan B, which is now submitted for the approval of the First Commissioner, was brought before the board, it was set aside or postponed for further information; and that, when that required information was furnished, the plan was deliberately rejected.

The First Commissioner agrees with the board in the several decisions arrived at, which he considers to have been quite correct. By the resolution of the 27th of October, which was placed in the hands of the First Commissioner on Wednesday last, it was determined that it be intimated to the First Commissioner of her Majesty's Works, &c., that the Metropolitan Board of Works had also had under their consideration other plans for discharging the sewerage into the river, and that it was the opinion of the board that, if any extension was desirable, the board would undertake the work, provided the additional outlay was paid out of the national revenue.

The First Commissioner cannot give any final opinion in relation to plans for the drainage of the metropolis until such plans shall have been adopted by the board, and submitted for his approval after such adoption; but he will, without delay, consider any plan so submitted. The First Commissioner desires me distinctly to state, that he has no desire and no intention to interfere in any way whatever in this mat-

ter beyond discharging the duty which is imposed upon him by the statute; but, if the board should desire to see him previously, he will be most happy to receive a deputation from the board, and to confer with them upon this important subject, in the hope and with the desire that it may be brought to some satisfactory issue.

I am, sir, your most obedient servant, ALFRED AUSTIN, Secretary.

The CHAIRMAN said, I feel it necessary to make a few observations to the board upon this matter. Since the plan was taken up to the First Commissioner, I accidentally met him under this roof on Monday last, at the civic dinner. He then expressed a wish to have a little chat upon this vexed question, and we did have a conversation accordingly. I pointed out to him some of the considerations which I thought to be of importance, and which I believed had led to the decision of this board. He then expressed a wish that he might have an opportunity of discussing the question more at large with me, and requested that I would call at his office on Tuesday. After the committee broke up yesterday I did call upon him, and we went into the whole matter of the plans. He stated frankly that he had no desire to interfere with the duties or the rights of this board, but he felt himself called upon under the statute to discharge a very important, and in this case a very difficult, duty. He considered that he was bound to see that any plan sent up by this board to him for approval, was one which was in accordance with the act of Parliament; and he had no discretion in the matter beyond what the statute actually prescribed. He then expressed a wish that the matter could be discussed by an interview with himself. I stated the difficulties which the board had to contend with, and pointed out to him the resolution which the board had agreed to when the plan was adopted—viz., that they would be willing to extend the outfall, provided the Government were prepared to obtain for us the necessary funds to pay for that extension; at the same time informing him that the board did not feel that they were justified, at the cost of the ratepayers of the metropolis, in extending beyond the requirements of the act the system of sewerage further down the river. The board, I stated, felt that, if not technically, they had substantially, conformed to the act of Parliament in relieving the River Thames from pollution, for which our act was specially passed. I also stated to him at the same time that, on the question of contribution, I personally had a very strong opinion, that not only was it the duty of the Government to find funds for the extension of the main drainage works beyond the point required for metropolitan purposes, but I thought we had a very fair claim and good cause to ask the Government to contribute towards the construction of those large works themselves, independently of the extension. I observed to him that, considering the large amount of government property in the metropolis, which, though so much benefited by the system of drainage, was entirely exempt from any taxation in respect of it; considering, too, that we were providing for the sanitary improvement of the seat of government, where the representatives of the people of the country resided half of their time, and where the court and all the officers of state, as well as all the large public institutions of the land, were established—I thought we had, as representing the metropolis, some claim upon the national funds to support us in carrying out these large structural works. At all events, I said, I had no doubt at all in my mind that it was the duty of the Government, if any extension of these tunnels beyond the metropolitan area was required, to subscribe the necessary funds for doing it. To this Sir B. Hall said that, so far as he was concerned, he felt there was force in my position, and he assured me that his desire was to meet the board in a proper spirit. He also added that, if a deputation of the board should be able to make out to his satisfaction that we had such a claim, he was prepared to submit the matter for the consideration of the Government. Now, I think that more than that we could scarcely ask from one member of the Government, who was speaking without any previous consultation with his colleagues. I must say that the spirit in which Sir B. Hall met me on this question, in an interview of an hour and a half, during which we went over the whole matter, was one most creditable to himself, and which showed that, whatever previous irritation might have existed, there was, at all events, a desire to help the board in this difficult question—for Sir B. Hall admitted that it was a difficult question. I have no hesitation in saying that my conviction is very strong that, if the board were to appoint a deputation to consult with him on this matter, we should be able to arrive at a decision, satisfactory alike to ourselves and to the public at large. I cannot but feel, seeing that Sir B. Hall has a veto under the act, it would be wiser for us to waive any personal feeling we may have, seeing that the duty we have to discharge is so important, and the public are anxiously looking to this board for this great and vexed question to be brought to a conclusion. At present, we have little credit for any amount of labour and attention which we devote to public duties; and we shall not have, until some progress is made in this work. You may get through a large amount of business at this board, but, till you do something in reference to the main drainage, the public will not believe you are doing anything practical, for they are in comparative ignorance of the work which you get through from week to week. I do hope, therefore, we shall show the same disposition to meet the First Commissioner privately as he has done to meet us, and that we shall go over and discuss with him all the different points that are involved in this great question, and see whether some mode cannot be adopted to enable us to surmount the difficulty in which we are placed. I think we shall better consult the interests of the public and the character of the board itself by such a negotiation, than we shall do by fighting at a distance through dry official communications. I feel that much time might have been saved had a different course been adopted at an earlier stage of our proceedings; but that course was not adopted, and now lamentations are useless, and will not forward the question in hand. I hope that each member of the board will address himself to the matter in that spirit which will be indicative of a desire to bring it to a satisfactory conclusion, and that we shall meet the First Commissioner without reference to any previous transactions, but with a special desire that the great metropolitan question of intercepting sewerage shall not miscarry by any remarks on our part which we may, perhaps, feel under the circumstances would be justifiable. In this respect I hope we shall put a little restraint upon ourselves, and shall go up to the Chief Commissioner in the spirit in which he offers to meet us, and I have no doubt we shall come back sufficiently informed as to what will really satisfy the Government in this matter. When I look at the whole question, and see that there is a disposition to consider the resolution which the board have passed—that there is a recognition of the principle which you yourselves have adopted—viz., that you are willing to extend the sewerage, if the Government will assist you in the extension—I think there need be no great difficulty in arriving at some solution of the question. I have no doubt that the board will adopt the course suggested, and I am sure it will be a matter of the utmost gratification to every member present if we can come to a satisfactory conclusion on this very important matter. I have felt it my duty to make these observations in explanation of what has occurred, and I hope I have made myself sufficiently clear thereon.

Mr. CARPMAEL said: I am anxious that no time should be lost in considering this matter, and therefore I move that the letter from the First Commissioner be taken into consideration on Friday next.

Mr. BRISTOW seconded the motion, which was at once adopted.

The board then adjourned.

FRIDAY, Nov. 14.

The Board met this day in the Court of Queen's Bench, Guildhall—Mr. THWAITES in the chair.

The minutes of the last board meeting were read and approved.

SOUTHWARK IMPROVEMENTS.

The CLERK read the following letter from the First Commissioner of Works, in reference to the proposed new street from London Bridge to Stamford Street, the plans for which were submitted to Sir B. Hall on Monday last:—

Office of Works, &c., Nov. 12.

Sir,—I am directed by the First Commissioner of her Majesty's Works, &c., to return to you herewith, approved by him, the plan submitted to him on the 10th inst., by a deputation from the Metropolitan Board of Works, for a new line of street between High Street, Southwark, and Stamford Street, Blackfriars, and to request that you will be so good as to move the board to furnish the First Commissioner with a copy of that plan, to be retained in this office.

The First Commissioner, however, feels it to be his duty to state, that he had received some deputations and had seen several persons on this subject, and that, although they expressed various views as to the line of street, and some of the features of the scheme, they almost all agreed that it would be very desirable to remove the block of buildings situated between High Street and Counter Street. The First Commissioner pointed out that these buildings were coloured for insertion in the schedule, and that the Metropolitan Board would therefore have full power to render the improvement still more complete, if they should find it necessary or expedient to do so.

I am, sir, your obedient servant,

ALFRED AUSTIN, Secretary.

THE MAIN DRAINAGE QUESTION.

Mr. CARPMAEL proceeded to call the attention of the board to the communication from the First Commissioner of her Majesty's Works, &c., relative to the plan of the main drainage of the metropolis, submitted to him on Wednesday, Nov. 5, by a deputation from this board. In doing so, he said his anxious desire was to avoid making one observation that would create a discussion, or prevent them coming to a unanimous decision on the motion he intended to submit. It was not his intention to offer any remarks upon the interview lately held between a deputation of this board and the right honourable gentleman at the head of her Majesty's Commission of Works, for he felt that he should be best consulting the dignity of this board by avoiding any expression of feeling on the subject; nor would he at the present time discuss in the slightest degree the advantage of one system of intercepting sewerage or the disadvantage of another. His object was to invite the board to come to a resolution which he believed might be of advantage to the public interest, and would certainly promote a better understanding between them and her Majesty's First Commissioner of Works. A long time back it was his anxious wish to have a deputation, when the original plan was sent back by Sir Benjamin Hall; and on that occasion he differed with his friend Mr. Bristow, who withdrew a motion to that effect, and he endeavoured to bring it forward as an amendment, but was prevented by the rules of the board. However, the question was now before them, in consequence of a partial suggestion of the right honourable gentleman. Sir B. Hall, in the last paragraph of his letter, had invited a deputation from that board to confer with him upon the subject of the drainage of the metropolis, and he (Mr. Carpmael) thought the board might, by having an interview with that gentleman, come to a better understanding on a matter in which both the board and the First Commissioner were equally interested. Let there be a conference, by which the views of the board on the subject of the drainage of the metropolis might be made known to the First Commissioner, and his views thereon be made known to them. Without intending to abandon his own opinion, still he wished to deal with the subject in a practical manner. They had been told by a high authority that the larger portion of the world was governed by compromise; and therefore, as a practical man, he was content, if he could not get all he wanted, to get that which was next best, all that he could towards it. With this view, he would now move, "That the Chief Commissioner of her Majesty's Works having suggested the propriety of a conference between himself and a deputation of this board, be it resolved that the chairman and the following members (12 or 14, as may be agreed upon), accompanied by the engineer and clerk, be a deputation to confer with the Chief Commissioner on the various plans for intercepting the sewerage of the metropolis."

Mr. DENNIS seconded the motion.

Mr. HOWS thought the difficulty in coming to a vote on this question would be, the choice of the deputation.

The CHAIRMAN: That will come after.

Mr. HOWS said, if the resolution did not involve the mode of selecting the gentlemen who were to form the deputation, he would give it his support.

Mr. TURNER agreed in the principle of having a deputation, but he thought it would be well first to understand what was its object, and what subjects were to be opened by them before the Chief Commissioner; and for this reason:—If he understood the letter of Mr. Austin aright, what was proposed by the Chief Commissioner was, not to have a free conversation on all the plans submitted to him, including plan B, but excluding that particular one. If so, that was a position in which the board ought not to be placed. He was quite willing to go up to Sir B. Hall, but then it must be to discuss plan B as well as all the rest, otherwise in what position would they be placed?

The CHAIRMAN: Is not the whole question opened by this resolution? I so understand it.

Mr. TURNER wanted it to be so expressed, because the Chief Commissioner clearly excluded plan B in his letter. He said in effect, "I object to plan B because it does not satisfy the requirements of the act; but you tell me there are other plans, to which I can say neither ay nor nay until I have seen them. If you have such other plans, I am willing to see you on the subject"—thus excluding from his own mind plan B. Now he was of opinion that the board should tell the Chief Commissioner that they adhered to plan B, but that he having opposed it, they were willing to have a conference with him on the whole subject, otherwise he might very fairly infer that the board wished to confer with him about going further down the river. Let the Chief Commissioner be informed that they regretted he disapproved of plan B, but that they respectfully adhered to their former opinion, believing that it would satisfy all the requirements of the act; yet, as he had proposed a conference upon the plans, they would gladly avail themselves of the opportunity to discuss the whole question with him. Then there could be no possibility of mistake arising; but, unless they did so, their conference could not come to an agreeable conclusion, and they would be shut out from plan B, which he believed the best, and upon which he wanted the board to come back and take their position before public.

Mr. BRISTOW said the First Commissioner had not returned plan B because of any opinion he had formed as to its merits, but he withheld his approval because it was contrary to the letter and spirit of the act of Parliament. If, therefore, they could by possibility frame a resolution which would take that plan up to him again, it would not help the board, because they as well as the First Commissioner were bound by the letter and the spirit of the statute. Such being the case, the more free they were the better; and this

resolution, as it appeared to him, left them at liberty to discuss any plan which did not involve a violation of the act of Parliament.

Mr. WILKINSON said he thought the last paragraph of the letter, in which it was expressly said that, if the board should desire to see the First Commissioner previously to the consideration of any plans (not any other plan), he would be happy to receive a deputation, was a complete answer to Mr. Turner. Their conference with Sir B. Hall, therefore, would be unembarrassed by any previous decision whatever.

Mr. D'IFFANGER was opposed to the idea of restricting the deputation to a limited number. He thought the members of the board generally should have the opportunity of attending. For his part, as the representative of an important constituency, he should consider himself degraded if he were excluded.

Mr. H. L. TAYLOR said, he should experience the very opposite feeling to that of the last speaker, and was very vexed indeed that the board talked of going at all. In doing so, they were abandoning that independent and proper course which appeared to him to be one of the most important elements in the constitution of a body like that, constituted as it was on the principle of self-government. They had been discussing the question for months, and had at last come to a resolution to place a plan before Sir Benjamin Hall which a majority of the board believed was in compliance with the act of Parliament. The minister turned round and rejected the plan, and yet every member of the board seemed to be vexed that he might not go to the minister and allay the objection in his mind. The most independent position the board could take was to stand by their decision, and not allow themselves to be influenced by the opinion of one individual who happened to have the power vested in him, though that individual was the author of the scheme which brought the board into existence. In seeking an interview, they were pursuing a course most derogatory to the interests of the board, as well as to the interests of the ratepayers at large. It might be thought by some simple-minded men that they were going to Sir B. Hall to discuss with him the scheme B, which had been adopted by them, but there never was a greater mistake in the world. Why, in two lines the First Commissioner had placed before them his views respecting the plan on which the majority of the board had set their hearts; for, in his letter the First Commissioner observed, "It appears that at every time up to the 6th of October last, when plan B was before the board, it was set aside;" and he added these words, "The First Commissioner agrees with the board in the several decisions arrived at, which he considers to have been quite correct." Now he (Mr. Taylor) contended that the board ought to adhere to their decision, and he defied the minister to maintain the veto which he had so incautiously and inconsiderately placed upon a plan than which no better plan could be suggested, with the addendum that was placed against it, viz., that if the plan were to be carried further down the river, the board had no objection, provided the funds for defraying the expense were furnished by the Government. He would therefore advise the board to adhere to their plan, and let Sir B. Hall, if he pleased, confer with Lord Palmerston thereon. It was only for the Prime Minister to say that the money should be forthcoming, and he would pledge his word that the board would be prepared to carry the sewerage as far down the river as it might be desired, not for the benefit of the metropolis alone, but for the inhabitants of Essex and Kent, or anywhere else. He (Mr. Taylor) was sorry his friends were taking the course they recommended, and which, he believed, was fatal to the independent action of the board, and destructive of that principle of local self-government so much vaunted by Sir B. Hall when he introduced the Metropolis Local Management Bill into Parliament. Why, the moment that the board, who represented the metropolis, agreed to a plan which commended itself to their judgment, the minister turned round and said, "Local self-government! no, that's not it; it must be my plan that is to be carried out:" in other words, the board were to become the creatures of Sir B. Hall. Was that the way to deal with 45 gentlemen representing the largest constituency in the world? He, as a member of the board, felt himself degraded by the course proposed to be pursued—that of placing themselves on their knees before a minister of the crown, and offering to become his creatures. He could imagine very well that those in the minority on this plan B would agree to go, but he was surprised at those who, having voted for the plan and still believed it was the best, should fall in with Sir B. Hall's proposal to discuss some other plan. He did not think the course was a right one, and he did not believe it could lead to any practically good result. Thanks to the act of Parliament, it would require a majority of two-thirds of the board to rescind the resolution which they had adopted; and, with his present convictions, he would never be a party to such a proposal. Every plan having hitherto been rejected, the only alternative left to the board appeared to be that of resolving to take the sewerage down to Sea Reach, with a proviso that the money should be furnished by the Government.

Mr. BRISTOW rose to order. The question before them was—Deputation or no deputation?

Mr. TAYLOR admitted it, but the whole question was involved in this, and if a deputation was sent to Sir B. Hall, the board was pledged at once. The other alternative, as he had said, was Sea Reach, and that appeared to him to be the only way left by which they could maintain their own views, and, at the same time, comply with the wishes of the minister; but he felt that, as the representatives of the largest constituency in the world, they would degrade themselves by going to the minister at all as proposed.

Mr. DOULTON said he firmly believed that a deputation would lead to some practical result. The honourable member who had just spoken recommended a course which, if adopted, must ensure the destruction of the board. Sampson-like, he was resolved to pull down this house of the Philistines, even though he himself should be buried in its ruins. On the contrary, he (Mr. Doulton) wished to see the board a permanent institution; and, because of this, he was in favour of a conference. He trembled for the existence of the board if they determined to ride the high horse, and say, "If we cannot have plan B we will have no plan at all;" and the only way in which they could get out of the difficulty which they all felt, was to adopt the proposition now before them. The honourable member (Mr. Taylor) complained of the treatment they had received from the First Commissioner, but he would tell him that it was the remarks which he and others, who were ready to take every opportunity to insult Sir B. Hall, had made, which had called forth the remarks about which he now complained.

Major LYON said he should have given a silent vote had the question been put ten minutes ago, but, after the observations of Mr. D'Iffanger, he was compelled to make a remark or two. He begged to tell that honourable member that, as he was so anxious to form one of the deputation, he should have his (Major Lyon's) place, should he be chosen by the board, as he had no wish to take part in what he believed would be a useless interview. He begged also to say that he adopted every word uttered by Mr. Taylor; and, more than that, it was his impression that the board ought to stand by plan B; and, if plan B could not be passed, then let nothing be passed at all, because the board had decided by a large majority that this was the best plan to be adopted. With regard to what was to take place at the proposed interview, he agreed with the honourable member for Hampstead, whose observations were remarkably clear, and had not been answered. When they went to Sir B. Hall, would he not say to them, "The second paragraph in my letter tells you I will not have plan *B*, for I consider it is contrary to the act of Parliament; and, therefore, what is the use of coming here to discuss it? In doing so you are neither men of sense nor business." And what answer could the deputation give to such a rebuke? He (Major Lyon) would be willing to go if the right honourable baronet had said he was open to conviction, or if it were an understanding that they were to discuss every plan, but specially *B*, but not without; and he regretted that this course had been suggested by gentlemen with whom he usually voted. The last speaker had suggested that, if the board failed in this case, it would be their destruction; but the honourable member seemed to forget that it was possible Sir B. Hall, and not the board, would go the wall. He was the party who had got into the difficulty—not they; and evey paragraph in his letter which followed the second was mere verbiage—mere nonsense. The right honourable baronet seemed to be afflicted all at once with a kind of *cacoëthes scribendi*. He (Major Lyon) did not even know that what the First Commissioner had stated as facts were true; he had not taken the trouble to investigate them. Why, Sir B. Hall pretended to give the board the details of their own proceedings! It was mere waste of time; and, as he believed that would also be the result of an interview, he was willing to give up his place, should he be appointed, to Mr. D'Iffanger. Much had been said by Sir B. Hall in praise of "local self-government," but his (Major Lyon's) opinion was, that when the board elected their present chairman, they took the first step to degrade that principle in the eyes of the Chief Commissioner; and ever since there had been one continued state of warfare and interference. There was no doubt of the correctness of what the chairman had told them as to what took place between Sir B. Hall and himself in conversation; and, that being so, it was clear that in his letter the Chief Commissioner said one thing, and in conversation another. He told the chairman that he desired to have a conference with the board; in his letter he said, if the board desired a conference he would see them. Now he (Major Lyon) did not want to see him, for it was evident he could neither teach engineering nor English, nor could he tell him how to write a letter. Under such circumstances, although he would gladly accede an interview with a minister of the Crown who had a veto on their proceedings, if he desired it in a courteous way, he could not vote for the present proposition. He, of course, felt obliged to a gentleman who so greatly condescended as to stay away from pheasant shooting two or three days to see this board on the subject of a great metropolitan improvement; but, in reference to a vast engineering scheme like the intercepting drainage, he would rather trust Mr. Bazalgette.

Mr. BOYSON said, the great stumbling-block to any extension of the sewerage works was the expense; and, representing as he did a very poor parish, he had always felt it his duty to vote for every proposition which prevented them going too far down the river. For this reason he supported plan B, which he hoped to see carried out, unless the Government were willing to help them. If they were, he apprehended every member would feel himself justified in voting for the extension; and as, in the course of an interview, the deputation would elicit this fact, he was in favour of the proposition, believing that to adopt it would not be at all derogatory to the dignity of the board.

Mr. OFFOR differed with some of the remarks that had been made, but cordially agreed with the propriety of a deputation. He believed it was the outfall only that Sir B. Hall objected to. He (Mr. Offor) had voted for plan A, and then for plan B, believing it to be the most economical, and the best calculated to accomplish the object they had in view. But, if Sir B. Hall had in his mind some magnificent plan which would take the sewerage with the storm-water away in a constant stream to a point lower down the river, or even into the North Sea, and was prepared to find the money, he did not see why the board should not accept it; but he did object to being schooled into a knowledge of the act of Parliament; and he was perfectly satisfied that the first plan did not violate the equity of the statute, as it might be called, and that the present one did not violate any of the words of the act of Parliament. That being so, the deputation would go perfectly unfettered to confer with Sir B. Hall, and to learn from him why it was that he had objected to a plan which a large majority of the board thought so reasonable and so good. The deputation would have no power to pledge the board, but on their return they would feel themselves to be all better informed; and then they could consider whether they would adhere to plan B, or adopt some other plan. For himself, however, until some much stronger reasons were presented to him, he could not consent to go further.

Mr. WARE did not think there would be any abandonment of dignity in going to Sir Benjamin Hall. On the contrary, it would be evidence of captiousness and spleen on their part if, after what they had done themselves, they were to decline the invitation contained in Sir B. Hall's letter. The spirit of that letter evidently was, "I wish you would ask for an interview with me;" and was not the adoption of the plan B accompanied with a proposition made by the member for the City of London, which in itself suggested the necessity for a conference? In that resolution they said, "We have agreed upon plan B as the best and most economical, but we are willing to extend the outfall if the necessary funds are provided;" and one great object of the interview with Sir B. Hall would, of course, be to ascertain the views of the Government on that point. In effecting this, he thought that a small deputation would be better than the entire board.

Mr. DALTON would always stand up for the rights of the board, and on the present occasion the question was, "Have those rights been infringed?"

Mr. Doulton and Mr. Crellin also supported the resolution.

Mr. FEW said he thought the sending up of a deputation was the most natural thing in the world. The letter of Sir B. Hall made no allusion whatever to the offer of the board to carry the sewerage further down the river, provided Government would pay for it. That part of their resolution was left unanswered, and instead of answering it, Sir Benjamin invited them to a conference. It was their duty, therefore, to accept the invitation.

Mr. BIDGOOD was placed in some difficulty with reference to the last paragraph in the Chief Commisioner's letter. Supposing the board agreed to send up a deputation, how would they begin their letter informing Sir B. Hall of the fact? Would they say, "The board have had your rejection under consideration, and they desire to see you thereon?" Surely not; at all events, he, for one, did not desire to see the First Commissioner. They had adopted a plan for the drainage of the metropolis which they believed was the best that could be devised, and they intended to adhere to it. But then Sir B. Hall had told them he would not have it, but when they had some *other* plan to propose, they might, if they chose, see him on the subject. They were not, however, as he (Mr. Bidgood) believed, willing to do anything of the sort.

Mr. SEELEY: We have told the First Commissioner that we are.

Mr. BIDGOOD: Yes, if the Government find the funds.

The CHAIRMAN: That, I apprehend, will be an element in the conference—there can be no question of it.

Mr. BIDGOOD: I believe that when you go up to the First Commissioner and begin to talk about plan B, he will tell you, "I have refused that; I

will have nothing to do with it. Are you willing to go into the consideration of any other plan?" I hope the firm and unflinching answer of the deputation in that case will be, "No, we are not, unless we have an intimation from you that you are willing, on the part of the Government, to guarantee the additional cost. If you are, we will take it to Sea Reach, to Ramsgate, or anywhere else."

The CHAIRMAN: The deputation can agree to nothing. After the interview they will bring up a report, and the whole question will have to be discussed by the board.

Mr. LESLIE said he objected to the resolution, because it did not comply with the terms of Sir B. Hall's invitation. The letter said, "If the board should desire to see me," &c. But the board had now no plan before them —plans A and B having been rejected by the Government, and C and D by themselves—and therefore they were not in a position to go to the First Commissioner at all. He would now take the opportunity of doing what he had given notice he should do on this occasion—namely, ask the engineer a question. It appeared to him that since plan B was before the board, the size of the proposed reservoirs had been altered. He wished to know whether, by the sanction of the board, these cesspools had been diminished from 30 acres on the north side, and 15 acres on the south, to——

Mr. BAZALGETTE said the honourable member's question was, he feared, calculated to leave an impression on the minds of other members of the board which was not in accordance with the facts. He asked whether the size of the reservoirs had been altered, and to that he (Mr. Bazalgette) must give a distinct negative. In order to explain what appeared to be a difficulty to Mr. Leslie, he begged to state that, at the time his first report was before the board, it was proposed to have the reservoirs of a larger size in order to contain the whole of the sewerage discharged by the sewers, and also to afford space for the rainfall. This was objected to, and, in the course of the discussion which ensued upon the subject, it occurred to him that it was desirable, in a sanitary point of view, that the size of these reservoirs should be curtailed, and that it would be a better arrangement to allow the surplus rain-water occasionally to pass into the river beyond the time prescribed, rather than on 300 days during the year to have it spread over the bottom of the reservoir. Accordingly, when he was directed to prepare a plan for the extension of the outfall to Long Reach, he considered this point, and, in his report of the 17th of August, he stated his views on the subject in the following terms:—

> I recommend that for 11 months in the year the discharge of the sewerage into the river should take place at high water, and during the first half of the ebb tide; and that for the remaining 20 or 30 days of heavy rain, the discharge of the then diluted sewerage should also take place one or two hours before high water, by which means a reduction of the size of the covered reservoir from 15 to 4 acres might be effected, and an increase of it obtained, so that it would contain about 2,500,000 cubic feet; in other words, it would not be more than half full during nine months in the year, and would leave the other half of the reservoir free for the storage of upwards of a million cubic feet of rain during the remaining three months. This will be found sufficient, probably, for the next 15 or 20 years; and it would be better hereafter, if necessary, to enlarge the reservoir, rather than now to spread its contents over a more extended surface.
>
> The foregoing instructions, however, direct the preparation of a plan for the discharge of the sewerage at and after high water only. I therefore beg to report, so sudden and unequal are the quantities of rain that fall, that, to avoid the discharge of the sewerage before high water on the 20 or 30 days per annum, would necessitate the construction of a reservoir of double the size now proposed, at an increased estimated cost of about £40,000.

From that period up to the present, he had adopted, and was still prepared to adopt, that calculation; and he believed that it was by far the best arrangement. As the reservoirs there stood, they accomplished all the objects desired in a more satisfactory manner than by the former proposition. At the same time, he had reserved in his estimates the original amount, so that if hereafter it might become necessary to enlarge these reservoirs, there would be amply sufficient to do it.

Deputy HARRISON said, it would have been most gratifying to his mind if the question raised by the motion had been settled long since, and he regretted that so many other matters had been imported into the discussion. In supporting the motion, that a deputation be sent to Sir B. Hall, he would take the opportunity of pointing out the course he thought it likely the deputation would take in reference to plan B. The Chief Commissioner had rejected that plan because, in his opinion, the outfall was at variance with the intentions of the Legislature. In this instance, therefore, he had given a reason for the rejection of the plan. Again, he said that it was contrary to the spirit of the statute. That was a second reason. Now, when he came to talk with Sir B. Hall on the subject, he would tell him that the words of the act of Parliament were equally binding on him and on the board, and that it was not for him to be the interpreter of the intention of the Legislature, nor was it for him to say that the plan was contrary to the spirit of the act. He (Deputy Harrison), on the contrary, maintained that the plan B was within the provisions of the act. He represented upwards of £1,000,000 sterling of rateable value, and he had to consider whether he was justified in consenting to an outlay beyond what was for the benefit of those who were the owners of that property. The act only gave the board power to execute works for the benefit of the metropolitan districts, and he, for one, was not willing to go beyond it; and, without compromising themselves in any way, it was possible that they might convince the First Commissioner that they were right in the conclusion at which they had arrived. The difficulty in which the board was placed arose from the 135th clause, by the introduction of the words, "in or near the metropolis." If those words could be erased, there would be no difficulty at all. He would be delighted to see the noble work which had been entrusted to them completely executed; but nothing should induce him to consent to anything beyond what they were empowered to do by act of Parliament.

Mr. Hawkes, Mr. Snow, and Mr. Nicholay, supported the motion, after which,

Mr. CARPMAEL replied: What he proposed was, that the deputation should confer with Sir B. Hall upon the whole of the plans, A, B, C, and D. He thought the honourable member for the City of London (Mr. Taylor) had fallen into an error in speaking of this board as "independent." They were not independent, but were bound by the statute to act in concert with another board—her Majesty's Commissioners of Works and Public Buildings. This board had power to originate plans for metropolitan works, which her Majesty's Board of Works had not, but the latter had the veto upon the acts of the Metropolitan Board; and therefore it seemed to him to be much the wisest course, when a difference of opinion arose, that the two boards should have a conference, and settle, if possible, the points at issue. In doing so, they were following a very high example, for it was the well-known practice of the Houses of Parliament, when they differed on some particular provisions of a measure which they were otherwise desirous of carrying, to hold a conference, and so adjust the point in dispute. With respect to "bowing to a member of the Government," he did not believe that any one present had such an idea, nor did he believe Sir Benjamin desired it.

The question was then put, when there appeared—

For the motion	38
Against	1
Majority	— 37

An animated discussion then arose as to the appointment of the deputation, in the course of which

The CHAIRMAN said he hoped the idea of their having "a one-sided deputation" would be banished from the minds of every member present. He thought it would be most inconsistent for the board to send up a deputation representing all the abstract and concrete opinions which, in the course of their deliberations, had been expressed or suggested, for the purpose of having a discussion upon the whole in the presence of the First Commissioner. He could not at all understand that the object of the deputation was to be the illustration of the personal views of honourable members on this very important question, but that they would go up as the representatives of the metropolis at large, and as having its welfare mainly at heart; and that, should the Government ask them to extend the system of sewerage for other than metropolitan purposes, they would be united in requesting a national contribution for the additional expense. It was very much to be hoped that no unseemly discussion would take place before the First Commissioner, and that no member of the deputation would express an anxiety solely to promote his own individual views, but that there should be a general expression of desire for this one object—the accomplishing most effectually the provisions of the act, and protecting the interests of the ratepayers at large.

Several amendments were put and negatived, and ultimately it was resolved that the deputation should consist of 12 members of the board, with the chairman, clerk, and engineer. The members chosen were—Deputy Harrison, Mr. Nicholay, Mr. Doulton, Mr. Hows, Major Lyon, Captain Barnett, Mr. Bristow, Mr. Seeley, Mr. Wright, Mr. Turner, Mr. Few, and Mr. Carpmael.

The board then proceeded to receive tenders for the construction of 3269 feet of brick sewer, and other works in connection therewith, in Pembroke Road, Foxley Road, &c., Kensington, and to hear and determine appeals and awards of compensation, which occupied the remainder of the sitting.

TUESDAY, NOV. 18.

An Adjourned Meeting of the Board was held this day at Greek Street, Mr. THWAITES in the chair, to receive reports from the Engineer and Superintending Architect.

Mr. BAZALGETTE reported on applications from vestries and district boards to construct sewers in various places in the parishes of Chelsea, St. George's in the East, Shoreditch, and St. George's, Hanover Square; and in the districts of Holborn and Lewisham, which were agreed to. He also reported on a letter from the Poplar District Board of Works, enclosing copy of memorial to that board from inhabitants of Bow Common and neighbourhood, complaining of nuisance from an open main sewer, and the discharge of sewerage therefrom into the Limehouse Cut, at Stink House Bridge. He stated that a brick sewer is now being constructed by the Metropolitan Board of Works, in lieu of the open Limekiln Dock sewer complained of, which will be shortly filled in. The sewerage is not discharged into the Limehouse Cut, as is supposed by the memorialists, but passes under it by means of a syphon, as it has done for many years past, and has a storm overflow into the Limehouse Cut. When the brick sewer is completed, less flushing will be required, and there will be a proportionate reduction in the amount of discharge into the river; and when the main drainage is completed, this overflow will be done away with entirely; but he was of opinion that it would be found that the nuisance complained of in the Limehouse Cut was mainly occasioned by the discharge from the various chemical works and gas-factories in that locality.

The report was adopted.

The SUPERINTENDING ARCHITECT reported on a number of applications under the Building Act, which were disposed of. On one of them, which was for the construction of an open columnar portico,

Major LYON said, at some future time he would call the attention of the board to the question, on which he wished also to have the opinion of the clerk, whether an alteration, without fresh application to the board, of any building, projection, portico, or other matter, for which the permission of the board has been given, of such a nature as to alter the character of the building, or other matter for which permission was given, is not contrary to the provisions of the 143rd section of the Metropolis Local Management Act, or of the Building Act?

The board then adjourned.

THURSDAY, NOV. 20.

DEPUTATION TO SIR BENJAMIN HALL.

This day, at twelve o'clock, the Deputation appointed to confer with Sir Benjamin Hall, in reference to the plan for the main drainage of the metropolis, attended at the Office of Works, Whitehall Place. There were present the Chairman, Clerk, and Engineer of the board, and Mr. Harrison, Major Lyon, Captain Barnet, and Messrs. Nicholay, Doulton, Bristow, Seeley, Wright, Turner, Few, and Carpmael.

The First Commissioner was attended by Captain Burstall and his private secretary.

The CHAIRMAN, in introducing the business of the day, said he had great pleasure in attending before Sir Benjamin, and he begged to assure the right honourable baronet that it was in the very best spirit that they approached the discussion of this difficult question with her Majesty's First Commissioner of Works. He had no wish to make the plan which had been passed by a large majority of the board, but which had been rejected by Government, the ground of contest; still it was his duty to make some observations with regard to the reasons which had induced the board to pass that plan. In considering the whole question of the intercepting sewerage of London, and what ought to be the point of discharge, it was the deliberate opinion of the board that they had substantially complied with the provisions of the act of Parliament by the adoption of plan B. Whether that was the case in the contemplation of a lawyer he was not prepared to say; but he really thought that, in the judgment of every reasonable man, to discharge the sewerage at point B (namely, at Halfway Reach) was substantially an observance of the act; and that the sewerage being discharged at that point, could not injuriously affect the sanitary condition of the metropolis. In coming to a decision on the discharge at point B, a variety of elements had been taken into their consideration; but the question by which they had been mainly guided was of that finance. The board could not shut their eyes to the fact that, under the Metropolis Local Management Act, a number of local boards had been established for the purpose of improving the sanitary condition of their districts, and they had set about their business with an energy that did them the greatest credit, but the consequence of those works must be a very heavy taxation of the ratepayers. That, in addition, arising from the district boards carrying out their works and perfecting the net-work of sewers, would form a heavy item of taxation on the London ratepayers, together with their contributions towards this board. In consequence of that heavy taxation, it was a serious consideration with the board in agreeing to the plan, for they did not feel justified, for the

necessities of the metropolis, in spending one shilling more than was necessary. Having substantially complied with the act of Parliament, they did not feel themselves justified in continuing the sewerage beyond the point proposed, for other than metropolitan purposes, at the expense of the ratepayers. The board were ready to carry out the work in a comprehensive spirit; but, at the same time, as guardians of the ratepayers, they could not shut their eyes to the financial part of the question. The board, however, in passing the plan, added to the resolution their willingness to extend the system of drainage beyond the metropolitan boundary for objects not metropolitan, and were ready to carry out the plan, if the Government would provide them with the necessary funds for that purpose. There were many reasons which justified the Metropolitan Board in seeking a grant from the public purse. It could not be denied that the object the board was called upon to accomplish was essentially one of a public nature. The seat of government was situate in London, and the representatives of the people dwelt in the metropolis for six months in the year. In the metropolis, too, there was a large amount of government property, which was entirely exempt from taxation for sewerage purposes. There was Buckingham Palace, Royal stables and gardens; St. James's Palace, Chapel Royal, and German Chapel; Kensington Palace, stables, buildings, and Royal forcing-grounds; National Gallery; British Museum (rated at £1000 only); barracks, back of National Gallery; Horse Guards; Whitehall; barracks, Portman Street; barracks, St. John's Wood; St. James's Park, lodges and enclosures; Hyde Park, ditto; Regent's Park, ditto; Kensington Gardens, lodges, enclosures, guard-house, deputy-ranger's house and dairy; Green Park; Battersea Park; Greenwich Park; Kensington Park and lodge; Primrose Hill Park; Victoria Park and lodge; Chapel Royal, Whitehall; Parliament Houses; Wellington Barracks; Guards' Chapel; courts of law; Palace Yard; Westminster Hall; barracks, Knightsbridge; Chelsea Hospital and grounds; soldiers' chapel, Lisson Grove; the Custom House; the Tower of London. Besides these, there were many other properties of a public description which were exempt from rates, but which would be materially benefited by the works of the board, such as Blackheath and the Royal property thereon; Woolwich Common; Penitentiary; Queen's Bench and prisons; Marine Barracks, Woolwich; Artillery, ditto; the Arsenal; Westminster Abbey; St. Paul's Cathedral; St. George's Cathedral; churches and chapels, hospitals, and charitable institutions. That being so, the board felt that they had a right to ask the Government for a contribution to works for general drainage, to be carried to such a point so that they should not injure any one in the metropolis, and that they would have an additional claim if they were required to fix the outfall at some other point beyond that indicated in plan B. He would only repeat that the desire of the deputation was to bring the important question on which they came to confer to a satisfactory conclusion. Considering, however, that the plan of the board had been returned, for reasons which might or might not have been expressed in the letter accompanying its return, he felt that it was only a part of his duty to ask the right honourable gentleman—first, what plan would be satisfactory to the Government as to the point of discharge? and, next, whether her Majesty's Government were prepared to bear a part of the cost for extending the discharge from the point fixed upon by the Metropolitan Board to any other point? He had very great pleasure in referring to the amicable spirit in which the Metropolitan Board had received the communication from Sir B. Hall, and had appointed the present deputation. The proposition was adopted by a majority of 38 to 1. The board had no desire to cavil with her Majesty's Board of Works, but were willing to carry out any larger measure which the Government might require, upon the condition that the expense would not devolve upon the ratepayers of the metropolis. He hoped the result of the present interview would be, that they should arrive at a satisfactory conclusion on this very important matter.

Sir B. HALL said: It affords me great pleasure to hear you say that the Metropolitan Board are disposed to meet me in a good spirit, with a view to arriving at a satisfactory solution of this question, because it is the same spirit which I have uniformly endeavoured to show towards them. It will, therefore, be a matter of great gratification to me if the result of this interview should be the carrying out to a successful issue the object for which chiefly the Metropolitan Board was constituted. We both have the same object in view, that of carrying out the provisions of the act to the best of our ability. Before, however I address myself to that point, I will endeavour to disabuse the minds of the members of the board upon one or two points. Of course, I cannot be a stranger to what occurs at the sittings of the board, any more than the rest of the world. Your proceedings are public, as those of all other public boards are, and are dicussed and made the subject of report. Everybody therefore knows, and very properly too, what is going on at such boards. I observe that it has been very positively stated that my desire is to interfere with your affairs, and to meddle with them improperly. It is not for me to stop to inquire why such motives should be attributed to me. All I wish is to assure you—and which I do with great pleasure—that there exist no grounds for any such statement, and that I have no desire to interfere with your affairs in any way whatever. I have quite enough business on my own hands, both as a minister and as a representative of a metropolitan borough; therefore I need not state that I have not the slightest intention or the remotest idea of interfering in any way whatever with your affairs. It has also been said that I am attached to some definite plan of my own, and that I wish to extend plan B, and run it down even to the German Ocean. All I can say is, that I have never given any opinion at all as to where the outfall should be. All I have done is to endeavour to comply with the act of Parliament. It is that alone which has guided me in withholding my consent to the plans which have been submitted to me. These are the two points upon which I wish to disabuse your minds. There is only one more preliminary point I wish to touch upon, which assumes in some degree the character of a charge of neglect of duty on my part. It has been stated that, with regard to one of your plans, I unnecessarily delayed it; that I detained it for a month, when I ought to have given an earlier answer. Now, I believe the course which I took is well known to everybody, and one which I think was by no means a departure from what is usual in similar cases. Believing that you were about to forward to me a plan, I, in anticipation of what I thought would be the plan you intended to send me, conferred, on the 20th of May last, with the Admiralty, and requested that the Lords of the Admiralty would allow me to have the services of some gentleman conversant with the River Thames, and who was well qualified to make a survey of the Thames, and report upon the subject of the ebb and flow of that river. Captain Burstall was accordingly appointed by the Admiralty, who, on the 30th of June sent me his report. It was received here on the 1st of July, and on the 2nd of July I communicated it to you.

The CHAIRMAN said: As a matter of fact, I beg to mention that it was not upon the question of the ebbing and flowing of the tide, but upon the question of the discharge of the sewerage from the metropolis—and which latter, question was not referred to Captain Burstall—that you returned the plan and upon that ground only.

Sir B. HALL: If I had confined myself to the question as to the outfall being within or without the limits of the metropolis, I could have answered that point within 24 hours; but I thought it better to show you what the ebb and flow of the tide was. The only point, however, which I now wish to urge is, that matters, when they come into this office, are not unnecessarily delayed. You say that the plan B which was submitted to me was passed by a large majority of the board. I am quite aware of that; but I also know that it was on a previous occasion rejected by a large majority: but that is a question aside from the main point, and therefore I shall not advert to it in the slightest degree. You say that you have substantially complied with the act. The words of the act are very clear; they are, "that the board shall make such sewers and works as they may think necessary for preventing all or any part of the sewerage within the metropolis from flowing or passing into the River Thames in or near the metropolis; and the said board shall cause the sewers vested in them to be constructed covered, and kept so as not to be a nuisance or injurious to health." It is evident, therefore, that the sewerage must not flow into the river "in or near to" the metropolis; but by the first plan the sewerage would actually have flowed into the river within the metropolitan area. By the second plan, the sewerage would have gone outside the metropolitan area, because the point of outfall is stated to be three-quarters of a mile from the metropolitan boundary.

Mr. CARPMAEL: A mile and a quarter.

Sir B. HALL: I beg pardon; it is stated most distinctly in the report, that the point of outfall is three-quarters of a mile from the metropolitan area.

The CHAIRMAN: The flow of the river is one mile and a quarter.

Sir B. HALL: In the plan submitted to me it is stated that the distance is seven-eighths of a mile; but in the plan, I understand, which you intended should be carried out, the distance is a mile and a quarter. Now, when we take into consideration the point of outfall, we must also consider what will be the effect upon the metropolis of the flow of the tide. If you put the outfall at such a point that the sewerage will reflow within the metropolitan area, I do not consider that you have complied with the provisions of the act. I feel I was perfectly justified—acting, as I did, under good advice—in rejecting plan B; and it will be utterly impossible to sanction that exact point of outfall. The question raised by you, with regard to the expenditure that would be incurred by taking the outfall to such a point as would be, perhaps, unnecessary as regards the metropolis itself, is one which I think you ought to consider, and which, it appears, you have considered: but, if you suppose for a moment that I intend you should go to one farthing expense for work beyond the point at which the requirements of the act would be met, you are extremely mistaken. My object is to carry out the act in accordance with the intention of the Legislature and the spirit of the statute, and to call upon you to adopt such an outfall as will show that, by discharging the sewerage into the Thames at certain periods of the tide, it will not flow back into the metropolis. If it should be deemed advisable and finally determined to carry the sewerage further from the metropolis than the point absolutely necessary for the object of the act, and for the purposes of the metropolis itself, I do not think the inhabitants of the metropolis should be required to enter into that extra expenditure. To show you how anxious I have been to enter into this matter in a spirit of mutual co-operation, without any improper interference with your functions, I have instructed Captain Burstall to submit to me his views as to what he considered to be the nearest point to the metropolis where the outfall should be. I like coming to the question, and therefore I will proceed to state to you what are my views, as representing the Government, in this matter, as to the point to which you ought to go. I cannot do better, therefore, than read to you the letter which I have received from Captain Burstall. But, before I do so, I may as well state the course I shall take, whenever you send me a plan which I think I could properly sanction as regards the outfall; because, until you have determined the outfall, it would be in vain that we should enter upon the consideration of the other parts of the work. Everything must depend upon the outfall; that must be the basis of all your operations. Supposing we could agree, so far as you are concerned, with respect to the outfall, I should feel it my duty to tell you that I thought you had complied with the provisions of the act, so far as regarded that matter. The course I then ought to take, as a duty towards the public and the Government, would be to submit the plans which may be put into my hands to the consideration of one or two of the most eminent engineers in the kingdom, in order that they might check those plans, and advise me as to whether they embodied a scheme which might with safety, propriety, and expediency be undertaken. I am sure you will all agree that that is the only course I could properly pursue. [The First Commissioner then read a letter received by him from Captain Burstall, which stated that the nearest point to London at which the outfall should be made, so as at all times to be certain that the fullest proportion discharged at 1½ hour before high water would not flow in or near the inhabited part of the metropolis, is, for the south side, in the upper part of Erith Reach, 15 miles from London Bridge, seven-eighths of a mile from Erith Church, and a quarter of a mile below Jermington Point, nearly opposite Rainham Creek; and, at the north side, at Rainham Creek; and that the period of discharge should commence at least one hour and a half before high water.] He then continued: The substance of this letter is evidently this—that, if you get your reservoirs sufficiently large to contain the necessary sewerage which may come down within the necessary period, then you will be able to discharge an hour and a half before high water, and continuously discharge for two or three hours after high water; and that then the sewerage will not flow back into the inhabited portion of the metropolitan area so as to be a nuisance; but, if your reservoirs are are not sufficient, then, of course, your calculations will be good for nothing, because the whole of the calculations are based on the capacity of these reservoirs. Captain Burstall is in favour of extending the main drainage one mile of land, which would give them two miles of river; and I wish to get rid of a discrepancy which appears on the plan as to the size of the reservoirs; for, whilst Mr. Bazalgette estimates the sewerage on the north side to be 6,000,000 cubic feet, and that on the south 1,700,000 cubic feet, he only proposes to make his reservoir on the north side double the size of that on the south, which is only a difference of 1 to 2, whereas it ought to have been as 1 to 5.

Mr. BAZALGETTE said that, as regarded the point selected by the board for the discharge of the sewerage, he had mainly depended upon the experiments of Captain Burstall, all of which proved that the sewerage discharged at point B one hour before the turn of the tide, would not reflow within the limits of the metropolis. The point of discharging at B was 1¼ miles below the south metropolitan boundary. Assuming that to be so, in dry weather he should propose that the discharge should be at high water, and for two hours afterwards. The sewerage in the reservoir would then not rise to the top of it, and he would let in the tide to dilute the sewerage, and let it out at high water. On the average, during the year, there were three dry days to one of wet; but he believed for 300 days in the year the sewerage would not flow into the metropolis.

Mr. CARPMAEL stated that, in the report, three hours had been set down as the maximum time for discharging the sewerage, but it was expected to be got out in one hour.

Mr. BAZALGETTE said he had always set down his plans in the most un-

favourable manner, but often his reservoir would not be full, and it would be necessary to let in the tide into the reservoir, so that all might flow away at high-water. In ninety days in the year he would take the advantage of an extra hour to discharge the sewerage, without flowing at all into the metropolis; and for thirty days they must discharge for three hours. He agreed with Captain Burstall, that they might safely discharge one hour before high water without returning to the metropolis; for, on the 25th of June last, Captain Burstall's float in the river was opposite Charlton Pier at 6h. 15m. A.M., and at the turn of the tide, at 7h. 16m., the float had reached Hookness, having floated up the river 1 mile 0·85 furlongs during the last hour of float. Mr. Bazalgette proceeded to give the *data* upon which his calculations were based as to the size of the proposed reservoirs, and the time of discharge. He believed that the reservoirs should be for 6,000,000 cubic feet on the north, and 3,000,000 on the south side, instead of 1,250,000 on the south side, as he previously stated.

The CHAIRMAN (Metropolitan Board) said, he believed that the size of the reservoir must be governed by the point of discharge; and, if the outfall was to be beyond point B, the reservoirs must be enlarged to meet the extra quantity.

Mr. BAZALGETTE said there was one point that he had not alluded to, and that was the reduction in the size of the reservoirs. In his first plan he proposed to receive the storm waters; but, since he was unwilling to have the sewerage spread over a large evaporating surface for the mere purpose of receiving the sewerage on a few exceptional days, he thought it better that it should be reduced in size, as it would scarcely ever be more than two-thirds full.

After some further discussion,

Major LYON said, that on a matter of such importance they were not to split straws, and he thought it hardly necessary to waste any further time in discussing such points.

Mr. TURNER said, no doubt the board will make the reservoirs of a sufficient capacity to meet the requirements of the outfall.

Mr. CARPMAEL: We have had a letter by Captain Burstall read to us, and what I am anxious to ask is, whether we are to understand that the plan indicated in that letter as to the points of outfall is satisfactory to the First Commissioner?

Sir B. HALL: Yes. What I mean to convey to the deputation is this—that I have consulted Captain Burstall as to the nearest point of outfall that would meet the requirements of the act, and Captain Burstall has stated that the two points set forth in his letter are the nearest points that would meet those requirements. I don't think I should be justified in asking you to go beyond those points. I should then be asking you to expend money for purposes other than was considered necessary by the Legislature for the metropolis. Therefore, I shall be perfectly satisfied, as regards the outfalls, if those set out by Captain Burstall be adopted. Of course, the capacity of the reservoirs must be accurately determined, because the fixing upon the point of outfall will be of no value unless the reservoirs are of such capacity as to allow the outfall within a certain space of time.

The CHAIRMAN: I understand, then, that the First Commissioner requires the Metropolitan Board to agree upon a plan fixing upon the point of discharge, north and south, as indicated by Captain Burstall, subject to the general revision of the engineer.

Sir B. HALL: Certainly, so far as you are concerned.

Mr. NICHOLAY: I understand that, although you would not sanction our coming nearer to the metropolis than the point indicated, yet you would not object to our going further?

Sir B. HALL: You may go to the German Ocean, if you like.

After some further conversation of a general nature, the deputation withdrew.

FRIDAY, Nov. 21.

The Ordinary Weekly Meeting of the Board was held this day in the Council Chamber, Guildhall—Mr. THWAITES in the chair.

The minutes of the last meeting were read and approved.

SOUTHWARK IMPROVEMENTS.

A deputation from the inhabitants of High Street, Southwark, consisting of Messrs. Mann, Newsom, Tomkins, Bailey, Mayhood, Newsom, Clark, Beard, Jones, and Sheppard, was introduced by Mr. Harris, for the purpose of presenting a memorial on the subject of the proposed new street from London Bridge to Stamford Street. The memorial was signed by 52 of the leading firms of the High Street; and it prayed the board to remove the Town Hall; to obliterate Counter Street from the map of the Borough; and, instead of commencing the new street at York Street, to carry it a little further down, namely, to Three-Crown Square.

Mr. NEWSOM, on behalf of the deputation, pointed out the advantages which the alteration in the plan suggested by the memorial would afford to the traffic of the locality.

The CHAIRMAN informed the deputation that, although the cost had not been included in their estimate, the board had scheduled the Town Hall and the houses interving between that building and the proposed new street, so that if at any future time it was felt to be desirable, they would have power to take them and pull them down. In reference to the other part of the question, viz., that of altering the point and extent of the curve of the new street, the board had determined that it should commence at York Street; and the Government had given their approval to the plan, and it would involve difficulties now to make any alteration in the plan. The board felt that in making a large street which would be the means of bringing much traffic into the Borough, it was very desirable to have the opening at a point where the greatest possible facility could be given for its passage.

In reply to questions by Deputy HARRISON, Mr. TAYLOR, and others,

Mr. NEWSOM said they had not made any exact calculation on the subject, but he believed the plan suggested in the memorial would be less costly than the one adopted by the board to the extent of £40,000, and that the saving thus effected would more than cover the expense of removing the Town Hall. He believed, also, that in this way better frontages would be obtained. He did not think that the inhabitants of the Borough set so high a value upon their suggestions that they would themselves be willing to pay for carrying it out, supposing it involved, as Deputy Harrison stated it would, £40,000 more instead of less.

On the motion of Mr. HARRIS, the memorial was received.

PROPOSED PARK FOR FINSBURY.

Mr. SAVAGE introduced a deputation from the vestries of the parishes of St. Mary, Islington; St. James and St. John, Clerkenwell; St. Mary, Stoke Newington; and the District Board of Works for St. Andrew, Holborn; to present a memorial on the subject of forming a park for the northern suburbs of the metropolis. The memorial set forth the steps which the aggregate committee had taken to carry out their object since 1850, which object had received the approval of successive governments, and by two of which notices had been given for obtaining the necessary parliamentary powers. On each of these occasions a change in the administration had frustrated the plan; but, at a recent interview with Lord Palmerston, the approval of the present Government had been obtained, and an offer of £50,000 had been made towards carrying it out. The cost of the work was estimated at £200,000, and the memorialists propose that this should be raised by a general rate upon the whole of the metropolitan district, as defined by the Metropolis Local Management Act. The memorialists pointed out the urgency of proceeding in the next sessions of Parliament, as the ground in the locality is rapidly being built over, and, unless speedily secured, will not be purchaseable except at a price which would render the undertaking hopeless. To facilitate the matter, they had inserted the necessary advertisements in the daily papers, and now asked the board to take the work into their hands, and apply to the Legislature for the necessary powers.

Mr. COX (the chairman of the deputation) entered into a lengthened statement on the subject, and in reply to the chairman of the board, said that the notices given by the aggregate committee could be taken to by the Metropolitan Board. If this was not done, the committee intended to ask the Legislature to appoint commissioners, who should have power to tax the metropolis for the purposes contemplated. In reply to Major Lyon, he said, the associated parishes did not volunteer to give any extra contribution to the object, but would bear their fair proportion of the expense with the other parishes and districts in the metropolis.

The memorial was received, and after some discussion ordered to be printed, and the plans lithographed, and circulated among the members; the subject to be taken into consideration on Friday next.

DEPUTATION TO SIR BENJAMIN HALL.

The CHAIRMAN said: Probably it will be convenient, and will be expected by the board, that the deputation appointed to wait upon the Chief Commissioner should now make their report. (Hear, hear.) All I have to say upon the subject is, that the deputation went up like men of business, and in the very best spirit, to settle the question, and that they were met in the same spirit by the Chief Commissioner. (Hear, hear.) I hope and believe that the report they are now about to present will be satisfactory to every member of the board.

The CLERK then read the report, as follows:—

METROPOLITAN BOARD OF WORKS.

REPORT OF DEPUTATION APPOINTED TO CONFER WITH THE FIRST COMMISSIONER OF WORKS, &c.

1, *Greek Street, Soho Square, Nov.* 21, 1856.

The deputation appointed on the 14th inst. to confer with the First Commissioner of her Majesty's Works, &c., on the various plans of intercepting sewers, have to report that, pursuant to the instructions of the board, they had an interview with the First Commissioner at the Office of Works yesterday, and that he then produced to them a report from Captain Burstall suggesting certain points of outfall for the intercepting drainage, which he (the First Commissioner) considered would satisfy the requirements of the Metropolis Local Management Act in that respect; and the First Commissioner gave the deputation to understand that, if the board would submit to him a plan of intercepting drainage, adopting these points, he would be prepared to approve such plan, so far as concerns the outfall. The deputation beg to submit the report referred to for the information of the board.

(Signed) EDWD. C. HARRISON, WM. CARPMAEL.

REPORT OF CAPTAIN BURSTALL.

"32, *Abingdon Street, Westminster, Nov.* 18.

"Sir,—In remarking upon the points of outfall for the sewerage of the metropolis, I beg to inform you that the conclusions to which I have arrived relative to the drift of the stream, are from the observations I made on the river in June last, from which I estimate the drift during the last hour and a half of the flood tide to be 3¾ miles at springs and 3 miles at neaps; consequently the water which passes point B at half a mile below the Halfway House will, during springs, reach the town of Woolwich before it is arrested by the ebb stream, and at neaps, a quarter of a mile below the Royal Arsenal. I should, therefore, submit that the nearest point to London at which the outfall should be made (so as at all times to be certain that the first portion discharged at an hour and a half before high water would not flow in or near the inhabited part of the metropolis), be the upper part of Erith Reach, 15 miles from London Bridge, seven-eighths of a mile from Erith Church, and a quarter of a mile below Janningtree Point, nearly opposite Rainham Creek. From this, as a point of outfall commencing at an hour and a half before the time of high water there, the upper part of the sewerage would at springs be opposite Barking Creek, and at neaps, off the magazine in the lower part of Barking Creek, near the metropolitan boundary. It cannot, therefore, be said that even from this position the sewerage would be perfectly clear of the eastern limit of the metropolitan area at spring tides, but it is certainly far enough from any inhabited district to guarantee, with those long floods caught by the north and north-west winds, the river would not be polluted in the vicinity of Woolwich. The additional length of drain necessary to be constructed to this outfall is exactly one mile, and the additional portion of river above it, thus freed from sewerage, would be a mile and seven-eighths. For similar reasons to those above stated, I would beg to suggest that the outfall on the north side be at Rainham Creek, which would be an extension of five-eighths of a mile beyond that proposed. With reference to the time that the pumping of sewerage into the river should cease, I would state that the water which first passed the outfall at three hours after high water will be carried 8 miles down, and back by the return flood about 13 miles, or 5 miles above the outfall; therefore, the latest period at which that process should be admitted is something short of three hours after the time of high water. It therefore becomes necessary, if a period of four hours is necessary for the discharge of the sewerage from the reservoir, supposing that reservoir is of sufficient capacity to contain it all, that the period of discharge should commence at least one hour and a half before the time of high water. If, however, it should appear that the capacity of the reservoir is not such as will contain the whole of the sewerage that may arrive from the metropolis between the period of one discharge and the next, the dimensions of the reservoir must be enlarged to meet the requirements. I beg also to call your attention to the fact, that when it was proposed to have the outfall at A (within the metropolis), the reservoir was to contain 4,000,000 cubic feet. It is now proposed to have the outfall at B, in the Halfway Reach, and the reservoir, when full, is to contain only 1,764,000 cubic feet, and to cover a space of 4¼ acres. On this, the south side of the river, for which the above provision is made, the amount of sewerage is calculated by Mr. Bazalgette at 1,250,000 cubic feet. On the north side of the river Mr. Bazalgette states the amount of sewerage to be 6,000,000 cubic feet, whilst the reservoir proposed there is to be only double the size of that on the south side. In this there is a discrepancy of proportion, because the area of the reservoir on the north side is to be 9 acres, and consequently 2 to 1. The amount of sewerage is 6,000,000 cubic feet, therefore nearly 5 to 1. In cases of heavy rains, it will be necessary to provide for the great accumulation of water which will run into the drain, either by outlets or a larger reservoir. In the first instance, the surplus quantity would flow into the Thames at various places, carrying with it a portion of the sewerage in solution; and in the last, immediately on the appearance of an extra supply in the reservoir, it would be imperative to commence pumping irrespective of the time of tide.

"I have the honour to be, sir, your obedient servant,

"The Right Hon. Sir B. Hall." "EDWARD BURSTALL, R.N.

Deputy HARRISON moved, and Mr. FEW seconded, the reception of the report, which was at once agreed to.

Mr. FEW moved that the report be printed and circulated among the members, and the consideration thereof be taken at a special meeting on Wednesday next.

Mr. SNOW seconded the motion.

Mr. LESLIE hoped another day would be appointed, as he was very anxious to take part in the debate, and would necessarily be absent from town on the day just named.

The CHAIRMAN said, before any discussion could be taken, the engineer must have time to prepare some facts for the information of the board, and he un-

derstood from Mr. Bazalgette that the earliest period at which he could be ready was Wednesday next.

Mr. WRIGHT said, before the motion was put, he wished to say a word. Mr. Carpmael, who had been obliged to leave, intended to have proposed a resolution conveying an instruction to the engineer to report upon the points of outfall suggested in the report of Captain Burstall. He (Mr. Wright) agreed in that course, because, however anxious he might be to expedite the decision upon this important question, it was impossible to arrive at an accurate result until the engineer had had time to look into the matter. He would therefore move, that the engineer be so instructed, unless the mover of the present proposition would consent to add it to his motion.

Deputy HARRISON said he would move, as an amendment, to omit the words in the motion after "circulated among the members."

Mr. LESLIE seconded the amendment. He thought every member ought to have an authenticated copy of the document referred to; and, moreover, he felt assured that Mr. Bazalgette could not be ready at the time suggested.

The CHAIRMAN: Probably the engineer will be the best judge of his capacity in that respect.

Mr. BAZALGETTE: I could not be ready by Tuesday, but on Wednesday or Thursday next I shall be.

Mr. D'IFFANGER said he did not understand that they were to have fresh plans prepared; the question of outfall was the only thing involved. It was merely an extension of the present plan.

The CHAIRMAN: It is a much smaller alteration than you would suppose.

Mr. CRELLIN supported the amendment, because the resolution assumed that they were to agree to the suggestion of Sir Benjamin Hall without any discussion.

The CHAIRMAN: Such is not the case.

The amendment was then put and carried.

Mr. WRIGHT moved, and Mr. D'IFFANGER seconded, "That the engineer be instructed to report upon the points of outfall suggested by Captain Burstall."

Mr. HAWKES objected to the motion confining the engineer to consider the points of outfall. Why not refer the whole question to him? The size of the reservoirs would have to be reconsidered.

Mr. WRIGHT said the outfall was the only part of the plan interfered with, and the only point settled by the Government.

Mr. LESLIE could not allow such a statement to go forth in an unqualified manner. The outfall was the only point raised by the Government *at present*.

The CHAIRMAN said, Captain Burstall's letter raises the question of the reservoirs.

Mr. WRIGHT: No doubt both the points are involved.

Mr. H. L. TAYLOR said: The board were now about to alter their plan, and adopt that of the Government. They were asked by the resolution to adopt the outfall laid down for them by the Chief Commissioner.

Mr. LESLIE objected to the motion, because it did not embrace the whole question. What was expected by the Government was, that the board should take up an entire plan founded upon the outfall laid down; and, though he did not say that they ought to abandon all that they had done before, they should require the engineer to bring up a whole plan for consideration. He clearly and distinctly understood that nothing had been determined by the Chief Commissioner, save that he thought the act of Parliament so imperative that the nearest point which he could sanction for an outfall was that named in Captain Burstall's letter.

Deputy HARRISON said he had looked carefully at the terms of the motion, and, having been present at the interview with Sir B. Hall, he felt satisfied that, if the board passed it, they would have such information before them as would enable them to judge correctly on the whole subject. The motion limited the engineer to the points raised in Captain Burstall's letter, and in adapting the plans to those points, they must, to a certain extent, be altered. The board were not asked to-day to pledge themselves to anything, but simply to call for certain information which, sooner or later, they must have before them.

Mr. TURNER thought the motion did not go far enough. There were two points involved in Captain Burstall's letter—the point of outfall and the size of the reservoirs. Now, the resolution said nothing about the latter.

Mr. D'IFFANGER: It is involved in the question of outfall.

Mr. TURNER felt that it was not explicit enough, and would therefore move, as an amendment, to add the words, "and the other questions raised in Captain Burstall's letter."

Mr. WILKINSON seconded the amendment, and took the opportunity to ask the chairman whether the question of deodorising had been brought under the notice of the First Commissioner?

The CHAIRMAN thought that the question of deodorising might most properly be brought forward at the time of discussing the amended plan of the engineer. In the meantime he would inform the honourable member that the question, as a whole, was not brought under the notice of the First Commissioner.

The amendment was then put and lost, and the original motion adopted.

It was also resolved that the discussion upon the subject should be taken at a special board on Tuesday week.

STREET IMPROVEMENTS.

Deputy HARRISON moved, and Mr. WILKINSON seconded, the following motion, which, after some discussion, was adopted:—"That it be referred to the works' committee to have prepared a bill to enable this board to carry out the improvements agreed upon by them in Southwark and Covent Garden, and to prosecute the same in the next session of Parliament as they may be advised; and that they also be instructed to confer with the finance committee as to the settlement of the clauses to be proposed in reference to raising the funds required for the purpose."

COMPENSATION APPEAL.

The remainder of the sitting of the board was taken up in considering an award of compensation for loss of office made by the vestry of St. Mary, Lambeth, to Mr. J. B. Clark, late clerk to the Kennington Lane Lighting Trust. The salary of that office was only £150; but certain fees for "preparing rates and acting as vestry clerk, together with the hire of a room in his house," made up the emoluments of this officer to £227. In consideration of his long service, the vestry almost unanimously voted Mr. Clark an annuity of £225 for life; and this award was now appealed against by the only dissentient vestryman, Mr. G. Taylor, who, however, was supported by a memorial signed by about 350 of the ratepayers of the parish.

The discussion on this case was long and animated. In the course of it, it was elicited that Mr. Clark still enjoys a very considerable income from sundry offices held by him in the parish. The two representatives of the vestry supported the award. A motion by Mr. Taylor, to reduce the amount to £85 a year for life, was, on an amendment by Mr. Dalton, negatived, and an award of £110 a year made in favour of Mr. Clark.

The board, having received tenders for the construction of 2,000 feet of sewer in the Isle of Dogs, adjourned.

AMALGAMATION OF THE CITY AND GREAT CENTRAL GAS COMPANIES.

On Friday, the 14th instant, the Chairman and Deputy-Chairman of the Great Central Gas Company, attended by Mr. T. Tyrrell, on behalf of the City Gas Company, and Mr. Charles Pearson, solicitor to the Great Central Gas Company, appeared at the Mansion House, in accordance with the Lord Mayor's request, in furtherance of the above object.

The LORD MAYOR said he had thought it his duty to request the attendance of the heads of the two companies, to learn if his good offices could be rendered instrumental in removing any obstacles that might still exist to the union of the two companies. He had no personal or pecuniary interest in the question. He had many friends among the directors and shareholders of both companies; and, knowing as he did that a large amount of money had been wasted in litigation, he was anxious to avert the recurrence of such an evil by endeavouring to promote a good understanding between them. The centre of the City of London was, undoubtedly, an unsuitable spot for a large gas factory. It would be impossible for the authorities of the City to disregard the complaints that had been raised against its continuance; at the same time, every right-minded person must regret the wasteful destruction of capital, and the serious injury that would be inflicted upon the shareholders, if the works were again subjected to indictment, and perhaps driven from the City even before the expiration of their act. He understood that Mr. Tyrrell and the City Solicitor, in consequence of what had passed, were engaged in preparing some plan for amalgamating the two companies, so as to remove the manufacturing of gas entirely out of the City. He had requested the attendance of those gentlemen, together with the chairmen of the companies, to learn whether any unforeseen difficulties had arisen.

The CITY SOLICITOR said that a plan had been prepared by himself and Mr. Tyrrell which had been favourably received by the chairman and deputy-chairman of both companies, and would be immediately laid before their respective boards. There was, however, one difficulty which had presented itself, and which at one time seemed a formidable obstacle to the settlement. It arose with Mr. Tyrrell's company, and he would perhaps best explain it.

Mr. TYRRELL said that the board of the City Company highly appreciated the efforts of his lordship; and, regarding him either in his private or official capacity, they should feel much gratified if his lordship would undertake to mediate in the event of any difficulties arising, but they really did not anticipate that such would be the case. The matter referred to by Mr. Pearson had, he hoped, been surmounted; it related to the price of gas.

The LORD MAYOR: I hope you are not going to raise the price of gas.

Mr. TYRRELL said, his company felt a strong conviction that it was not possible to manufacture gas of the quality now in use, and to supply it to the consumers, at 4s. per 1000, and at the same time pay a fair interest for the capital embarked in the undertaking. The City Company paid only 3 per cent. dividend, with gas at a selling price of 4s. He did not mean to insinuate that the Great Central acted in any way unfairly in paying 8 per cent. to the shareholders, by supplying the same customers with the same article at the same price; but, while they admitted the fact that the Great Central paid this dividend, the City Company could not account for it, and it had occurred to them that some provision should be made in the Amalgamation Act to secure an advance of price, if it should turn out that the gas could not continue to be manufactured upon the terms at which the customers of the Great Central now obtained it. He considered that capital advanced by private individuals for public objects was entitled to receive a good dividend, and the Legislature had repeatedly recognised the principle that such was the case. Even in the act of the Great Central, prices were not to be reduced unless the profit exceeded 10 per cent. per annum.

The LORD MAYOR said, 10 per cent. was not too much for a successful and prosperous company, if well managed; but he thought 8 per cent. paid by the Great Central was a very fair dividend, and he did not know that there was any probability of a reduction.

Mr. DAKIN (chairman of the Great Central) said that Parliament had fixed the price of gas for the City at 4s. at their request, and upon the representation of their witnesses that it could be made to profit at 1s. 9d., the difference between that sum and 4s. being sufficient, with a given quantity, to defray all charges affecting its distribution, and yield a profit of 10 per cent. to the shareholders. He had no reason to doubt the soundness of the calculations on which the act had been obtained. The illuminating power of the gas was undoubtedly better than the act of Parliament standard, and as such the Great Central might have a fair claim for advanced price; but, while they could continue to produce the best article at the present cost price, they were unwilling to disturb the arrangement made with Parliament. If hereafter it should be proved, as had been asserted, that gas could not be made to profit at the contract price, the company would have to go to Parliament to rectify the result of the miscalculation of their witnesses, upon whose evidence the price had been originally fixed. He agreed with Mr. Tyrrell, that shareholders who invested their capital in a useful and well-conducted public undertaking had a right to look for a remuneration of 10 per cent. Assuming that gas could be made at 1s. 9d. per 1000, which was now the contract charge at their works, he had no doubt that in a year or two the savings they would effect in the working charges by amalgamating the two companies, and the increased profit upon the increased rental, would enable them to pay 9, and even 10, per cent.

The LORD MAYOR asked how it was proposed to deal with the capital of the two companies?

The CITY SOLICITOR replied that, by the terms of arrangement prepared by himself and Mr. Tyrrell for the consideration of the directors, the amount of share capital and debentures of the amalgamated company to be given to the shareholders of the two companies was to be regulated by the rental of each, taking for their standard the rental and the capital of the great contract; the City Company being obliged, out of their share or debenture capital, to erect new works at Bow Common, and remove their gas manufactory out of the City. That, as far as he was concerned, was the great object in promoting the amalgamation. It had been his official duty to prosecute the City Company for a nuisance; and, if they remained in their present situation, it might devolve upon him to do so again, and he should be found to do his duty; but, whatever might be said in other quarters, he assured the directors it afforded him no pleasure to appear against them in the character of a public prosecutor: it would give him much more satisfaction to feel that under his lordship's auspices he had been instrumental in bringing about an arrangement by which the nuisance would be abated, the public convenience increased, and the interests of the shareholders duly protected, without increasing the price of gas.

The LORD MAYOR invited the directors and Mr. Tyrrell, if any difficulty should occur in the progress of the arrangement, to meet him again at the Mansion House; and the party took leave of his lordship, intending to give notices in the *Gazette* for a bill to accomplish the object they had in view.

EQUITABLE GAS COMPANY.

The Half-yearly Ordinary Meeting of the Shareholders of this Company was held at the office, 21, John Street, Adelphi, on Tuesday, the 18th inst.

The chair was taken at one o'clock by JOHN HOLDSHIP, Esq., chairman of the board of directors, and the secretary (Mr. Andrews) commenced the proceedings by reading the notice convening the meeting and the minutes of the last general and special courts, which were approved and signed.

The SECRETARY then read the following:—

REPORT OF THE BOARD OF DIRECTORS OF THE EQUITABLE GASLIGHT COMPANY TO THE PROPRIETORS AT THE ORDINARY MEETING, HELD ON TUESDAY, THE 18TH DAY OF NOVEMBER, 1856.

The directors have the pleasure of submitting on this occasion the accounts of the proceedings of the company for the half year ending the 30th of June last.

They have the satisfaction of reporting a progressive increase in the gas-rental, amounting to £1042 on the half year, as compared with the corresponding period of the previous year, and on £2316 on the year.

The directors regret to have to announce, in common with other metropolitan gas companies, a considerable reduction in the receipts for coke and breeze.

The new manufacturing plant was brought into full operation during the latter part of the period under consideration, and has continued to work in a satisfactory manner.

The new residences for the engineer and offices at the works are nearly completed and a part of the yard will be paved during the present year. These additions to your property will afford increased facilities for carrying on the general business of the company.

The directors have availed themselves of the opportunity afforded, by the use of the new retort-house, to repair and adapt the arrangements of the old house more in accordance with the latest and most improved mode of carbonising. The cost of these necessary repairs and alterations bears heavily on the wear-and-tear account for the time being, but the outlay is justified from the great advantages to be expected therefrom in the manufacture of gas.

The operations of the company continue to receive from your directors their constant attention, in regard to the maintenance of the strictest economy in every department, having, at the same time, a due regard to keeping up an efficient staff for an increased and increasing business.

The accounts for the half year have been examined and certified by the auditors. They exhibit a net profit on the half-year's working of £3201. 5s. 4d., which, with the balance of £829. 2s. 11d. of unappropriated profit carried over from the previous half year, leaves a sum of £4030. 8s. 3d., from which your directors recommend a dividend of 17s. 6d. per share, free of the income-tax, being at the rate of 3½ per cent. per annum upon the capital of the company.

The subjoined statements of accounts were then read:—

MANUFACTORY AND DISTRIBUTION OF GAS ACCOUNT, FROM JAN. 1 TO JUNE 30, 1856.

Dr.		*Cr.*	
To tradesmen's accounts	£398 4 11	By gas rental, to Midsummer, 1856	£23,314 3 9
Coals carbonised	12,392 17 1	Coke—proceeds of sales and stocks	3,239 0 7
Wages	3,306 9 5	Breeze, ditto	194 11 0
Rent, rates, and taxes	363 2 0	Tar, ditto	983 5 0
Directors' fees	375 0 0	Ammoniacal liquor, ditto	275 17 9
Auditors' fees	20 0 0	Gas supplied to other companies	75 15 7
Salaries	929 19 0		
Collector's commission	369 18 2		
Stationery, stamps, &c.	113 19 6		
General charges, &c.	185 14 5		
Gas allowance	164 17 0		
Wear and tear	3,854 14 9		
Profit and loss—half year's working profit	5,607 17 5		
	£28,082 13 8		£28,082 13 8

PROFIT AND LOSS ACCOUNT, FROM JAN. 1 TO JUNE 30, 1856.

Dr.		*Cr.*	
To dividends	£2,500 0 0	By balance of unappropriated profits, &c.	£3,329 2 11
Interest	1,597 6 4	Cash for bad debts received	37 9 6
Bad debts	540 4 8	Manufactory account—half year's working profit	5,607 17 5
General law charges	26 10 8		
Income and property tax	279 19 11		
Balance of accounts—profits	4,030 8 3		
	£8,974 9 10		£8,974 9 10

BALANCE-SHEET, JUNE 30, 1856.

Dr.			*Cr.*	
To investment—amount to Christmas, 1855	£224,811 13 3		By capital joint stock	£180,722 10 0
Ditto, charged this half year	1,782 1 6		Tradesmen's account	4,784 13 9
		£226,593 14 9	Taxes, rates, &c.	133 5 1
Gas rental, due to the company		14,863 8 9	Collector's commission	155 10 7
Cash balance		1,054 5 1	Auditors	30 0 0
Tradesmen's accounts, owing for products		1,380 5 3	Debentures	69,300 0 0
Coke, in stock		76 10 0	Ditto interest	307 2 7
Breeze, ditto		5 13 9	Gas deposits	178 18 0
Tar, ditto		133 12 7	Dividends	350 15 0
To ammoniacal liquor, ditto		10 6	Income and property tax	609 4 6
General stores, ditto		4,053 16 5	Profit and loss—balance of profits	4,030 8 3
Coals, ditto		3,563 16 8		
Service-pipes, ditto		199 19 0		
Main-pipes, syphons, &c., ditto		718 15 9		
Meters		8,041 0 0		
County court expenses—money in court		6 19 3		
		£260,692 7 9		£260,692 7 9

The CHAIRMAN said: The directors having volunteered to lay the statement of your affairs before the proprietors, so as to afford them an opportunity to examine them at leisure, I have nothing particular to say at the present moment, except any question should be asked, which I shall be happy to reply to. The works continue to progress, and answer the purpose, as mentioned in the report, up to the present time, and everything is going on perfectly satisfactory. I would just call your attention to one fact. You will see that we have used 1149 tons of coals less than during the previous half year, at a cost of £821 less than last year, and yet that we have produced 13,500,000 more of gas. I think you will consider that this is very satisfactory. I would also mention that the medical officers of the Board of Health have inspected our works—they were gentlemen quite independent of the proprietors or the directors—and they were engaged for an hour and a half in examining most minutely and critically every department, the result of which inspection was that they expressed themselves perfectly satisfied. At the present time it is most gratifying for me to have to announce, and for you to hear, that, notwithstanding all that is said about gas-works, these medical officers expressed it as their opinion that there was nothing that could be considered a nuisance in connection with our manufactory. (Hear.) With regard to the trade account, our rental has increased, and is increasing, as you will perceive, and everything is going on well. The only thing to be considered is, that, in consequence of this prosperous state of things, we may want to lay down pipes of a larger dimension; but, should this be the case, it will have to come before you at the proper time; and, if we do propose it, no doubt you will be prepared to sanction the work, as it will be money well laid out, and for the general advantage of the proprietors.

Mr. RHODES: With respect to bad debts—they seem rather high.

The CHAIRMAN: They are, though they are less than for the corresponding period last year. They are about 2½ per cent. upon the rental. We have examined the accounts very critically, and this is the result.

Mr. RHODES: Is there no plan by which these bad debts can be reduced?

The CHAIRMAN: We have reduced them very much, and hope to do so much more. Every time the committee meet, they give the subject their attention.

Mr. RHODES: It is the custom in some companies, where there is a doubt respecting a customer, to get him to pay beforehand.

The CHAIRMAN: That is what we do, as far as we can. You will see an item in the accounts for sums thus received, under the head of "Gas deposits."

Mr. RHODES: You have an item for wear and tear, which appears rather large.

The CHAIRMAN: It is very large, and might be reduced; but we thought it desirable this time to take the opportunity of doing a great deal to our old retort-house, so as to introduce a system equal to that which is in operation in the new one. We are going through the work most satisfactorily; and, when it is brought into operation, you will see the good of it. £800 is a large sum, but you will reap the advantage correspondingly.

Mr. RHODES: But, from what dropped from your lips, we are likely to require another large outlay for the purpose.

The CHAIRMAN: No; what I hinted at had reference to the distribution of gas—enlarging the size of the mains—which, if we are obliged to undertake, will, of course, prove an additional advantage.

Mr. RHODES: Then you have no resources to fly to for relaying mains, &c.? You have expended the whole of the money that you had power to borrow?

The CHAIRMAN: Not quite; but, if we use that, we must have an additional sum. The reference to this subject was only a hint and suggestion of my own.

Mr. T. BARTON: I beg leave to propose "That the report of the board of directors, together with the accounts, as examined and certified by the auditors, be received, and entered upon the minutes."

Mr. RHODES seconded the motion, which was carried unanimously.

Mr. PEARSE moved, "That a dividend out of the profits of the concern, of 17s. 6d. per share, being at the rate of 3½ per cent. per annum, clear of income-tax, for the half year ending the 30th June last, be now declared; and that the said dividend be payable on and after Monday, the 1st December next (Saturdays excepted), between the hours of ten and four."

Mr. RHODES seconded the motion, which was at once agreed to.

Mr. BARTON moved, and Mr. RHODES seconded, the next resolution—viz., "That the thanks of this meeting be given to the chairman and board of directors for the attention they have given to the affairs of the company during the past half year."

The resolution was very cordially adopted.

The CHAIRMAN acknowledged the compliment. He said, I may assure you, on behalf of my brother directors and myself, that we are extremely gratified by the vote you have just come to. I can only say that we do give our constant and very anxious attention to the affairs of the company, and that we shall continue to do so while we retain your confidence. I hope the result will be the increasing prosperity of your affairs.

A vote of thanks to the auditors closed the proceedings of the meeting.

WESTERN GASLIGHT COMPANY.

At the Annual Meeting of this Company, held at the Company's Offices, No. 28, Argyll Street, London, on Thursday, Nov. 13, 1856, the following report and balance-sheet was presented:—

The shareholders will have learned, from the accounts which have been forwarded to them, the result of the company's working for the year ended last Midsummer. The directors regret that these accounts do not admit of the declaration of a dividend—a circumstance solely attributable to the accident which happened in June, 1855, to the large gasholder erected by the company's former engineer, in the year 1848.

When the directors announced the occurrence of that accident at the last general meeting, it was not anticipated that any other expense would be entailed than the cost of a new holder. The consequences, unfortunately, have been far more serious. Although the directors believe that no similar work has been executed so rapidly, still the new holder was not erected by the time within which the contractors were bound, under penalties, to complete it; nor was it until the 27th of December that it

was available for regular service. Up to that period, therefore, the company had to meet a constantly increasing demand for gas, with only one-third of the gasholder room which previously existed. The difficulty, under such circumstances, of maintaining a continuous issue of gas (necessary, at any cost, in order to retain the consumers) will be readily understood by any person at all conversant with the business of gas-works. That difficulty was met by unremitting exertions and perseverance; and the supply, the directors are happy to say, was kept up without any interruption whatever. This, however, was only accomplished at the heavy cost exhibited by the accounts; reference to which will show that the smallness of the balance of profit is owing, not to any diminution of the gas rental, which, on the contrary, exceeds by £2829 the rental of the preceding year, but to the increase in the manufacturing items (coal, wages, works renewal, &c.), on which there is an aggregate excess of £3085—an amount which would have sufficed to pay a dividend of 4½ per cent.

Some of the shareholders may be of opinion that, inasmuch as the loss is attributable to the original defective construction of the old gasholder, it ought to be wholly or partly borne by the capital account. The directors regret that they cannot concur in that view. However reluctant they feel to suspend the payment of dividend for the period in question, they consider that that is the only proper way of meeting the case.

On contrasting the state of things which existed when they were last called together—and there was a divisible balance of nearly 5 per cent.—with the accounts now before them, the shareholders will naturally feel anxious to be made acquainted with the position and prospects of the company as they now stand. The directors are equally desirous that they should have the fullest information. They themselves believe that the position and prospects of the company at this period are better than they have ever been. The increase of rental above alluded to is worthy of notice, considering the extent to which the company was, during the winter, obliged to stint the supply to the consumers, and to enrich the quality towards making up for the deficient quantity; but, since the difficulties of supply have ceased, the rental has been increasing in a ratio far beyond that indicated by the printed accounts. For the quarter ended Michaelmas last, the rental from private consumers exceeded by upwards of 18 per cent. that of the corresponding quarter of 1855, and as early as the 11th ultimo the volume of gas issued had become greater than the largest day's consumption last winter. The works have been considerably extended and improved. By a new arrangement of the retort settings, the carbonising power provided by the original plan has been doubled, without the great expense of a new retort-house. The retort-beds, instead of being placed in a concentric ring, are now constructed for stage work in radii from the centre to the external wall of the house; thereby economising space, improving ventilation, reducing labour account, and facilitating generally the operations of the carbonising department. The retorts are entirely new, of clay, 20 feet long, and open at both ends. Two exhausters and one steam-engine have been erected, and another exhauster, with a second steam-engine, are in course of erection. The company's engineer expresses himself as perfectly satisfied with the new gasholder, as regards both the principle of construction and the working. The present storeage room is adequate to the supply of 1,000,000 cubic feet per diem.

During the current half year, the company has been working more profitably than at any former period; and, should the result prove as satisfactory as the directors anticipate, the proprietors will be called together, and the dividend paid earlier in the next year than has hitherto been the custom.

The year's expenditure on capital account, it will be seen, is much the same in amount as that of the preceding year. The principal charges are for the works above referred to, and for the large trunk-mains, which, the directors reported to the last meeting, had then become indispensable to meet the increased demand for the company's gas.

The directors have been enabled to complete these works without calling upon the shareholders to supply the funds, having raised the required amount by way of loan, the average rate of interest borne by the debentures being under 5 per cent. The proceeds (£7000) of the call on the class "B" shares, payable last January, discharged the first series of debentures due at that time. A further call of £2 per share will be required from the "B" shareholders early in the ensuing year, to meet the second series of debentures.

The proprietors will recollect that, with their sanction, the company was registered under the act of 1855, limiting the liability of the shareholders to the amount of the shares respectively held by them. The Joint-Stock Companies' Act of the last session has since repealed that act, together with the General Act of 1844, in accordance with which the company has hitherto been regulated. In compliance with a compulsory provision in the new act, the company has been reincorporated under it, with limited liability. The expense of the reincorporation is merely nominal; the effect is, that the proceedings of the company are now regulated by the new act and by the deed of settlement; but, inasmuch as the latter was framed to correspond with and carry out the provisions of the old act (of 1844), and is somewhat inconsistent with the new one, it is possible that the directors may have to take steps to remodel the deed.

Francis William Russell, Esq., M.P., Lieutenant-General Henry George Andrew Taylor, C.B., and Francis Edwards, Esq., are the directors, and Thomas James Briggs, Esq., the auditor, who retire by rotation. Those gentlemen respectively offer themselves for re-election, and have given the necessary notices.

London, Nov. 13, 1856. By order of the board, S. Barber, Secretary.

GENERAL BALANCE-SHEET, June 30, 1856.

Dr.				*Cr.*		
To proprietors' paid-up capital	£144,250 0 0			By permanent investment	£192,264 11 9	
Loans on debentures	38,600 0 0			Sundry debtors	15,393 3 5	
Bonds	6,000 0 0			Stock in trade	6,300 18 7	
		£188,850 0 0		Suspense	3,987 3 10	
Temporary loan, from bankers'		10,000 0 0		Cash in hand	2,031 6 0	
Sundry creditors		17,575 0 5				
Unclaimed dividends		178 10 1				
Reserved fund		3,627 7 7				
Profit and loss		346 5 6				
		£220,577 3 7			£220,577 3 7	

REVENUE STATEMENT, June 30, 1856.

Dr.		*Cr.*	
To coal	£20,419 10 11	By gas	£36,482 8 8
Wages—gas-making	5,000 15 7	Meter rental	1,080 16 0
Lime	328 6 6	Coke	1,551 9 7
Water, oil, and sundries	621 4 10	Breeze	436 1 10
Works' renewal	4,000 12 1	Tar	2,014 3 2
Restoring pipes and meters	495 3 11	Gas liquor	118 9 11
Lamplighting	1,204 13 4	Refuse lime	20 16 8
Repairing lamps	344 0 4		
Direction, salaries, and collection	3,661 3 9		
Rents, rates, and taxes	430 13 7		
Stationery and printing	183 10 8		
Incidental expenses	322 19 9		
Profit and loss	4,741 10 7		
	£41,754 5 10		£41,754 5 10

CAPITAL STATEMENT, June 30, 1856.

Dr.				*Cr.*			
To amount expended to the 30th of June, 1855, as per published statements		£202,061 12 4		By amount received for deposits, calls, and interest, and for instalments on shares forfeited; also, in respect of Belmont estate, for property sold, damage by fire, rents, and dilapidations, as per published statements		£160,467 1 1	
Expenditure, from the 1st of July, 1855, to the 30th of June, 1856, viz.:—				Loans—			
Works' extension	£5,058 6 10			Raised to the 30th of June, 1855	£27,000 0 0		
Main-pipes	6,062 8 11			Raised since	11,600 0 0		
Service-pipes	284 16 5					38,600 0 0	
Main-laying	2,139 8 4			Kensington extension bonds		6,000 0 0	
Service-laying	427 3 1			Amount received from shareholders in the year ended this day, viz.:—			
Reinstating roads	302 6 0			Calls on class A shares	£ 80 0 0		
Meters	642 4 3			Calls on class B shares	6,980 0 0		
Fixing meters	259 17 8			Calls in advance	100 0 0		
Burners	21 3 4			Interest on arrears of calls	10 10 9		
Lamp-posts and lamps	8 15 6					7,170 10 9	
Preliminary expenses	310 7 10			Lamp-posts and lamps sold		15 0 0	
Implements and apparatus	8 0 0			Belmont estate		4 1 11	
Horse power	74 15 0			Balance—excess of expenditure		3,414 11 9	
		13,609 13 2					
		£215,671 5 6				£215,671 5 6	

PROFIT and LOSS STATEMENT, June 30, 1856.

Dr.		*Cr.*	
To eighth dividend	£3,414 4 8	By balance, July 1, 1855	£4,020 18 3
Suspense	606 13 7	Revenue, profits in trade, one year to the 30th of June, 1856	4,741 10 7
Bad debts	535 0 3		
Reserved fund	1,080 16 0		
Interest	2,779 8 10		
Balance	346 5 6		
	£8,762 8 10		£8,762 8 10

Warsaw Water-works.—We learn with much pleasure from Warsaw that the Emperor Alexander has presented Mr. John Head (eldest son of Jeremiah Head, Esq., of Ipswich), engineer of the water-works in that city, with a magnificent gold ring, set with eight diamonds, accompanied by a letter thanking him for the zeal and energy which he has displayed in the construction of these works. The engines were manufactured by the Messrs. Ransomes and Sims, of Ipswich, under the superintendence of their late engineering manager, Mr. Henry Warriner. They consist of a pair of high-pressure, condensing, expansive, beam-engines, of 40-horse power; their superior construction and excellent finish have elicited the highest encomiums from numerons scientific gentlemen who have inspected them.

Gas Company of Buenos Ayres.—From a recent number of the *British Packet* (Sept. 27) we learn that the gas company lately established in that town had so far completed their works as to have commenced the public lighting on the 25th of May last, and that, at the period of issuing their report, dated Sept. 9, the directors were able to announce that they supplied 360 private consumers, using about 27,000 cubic feet of gas per 24 hours, and 500 street lamps, consuming about 2300 cubic feet per night. The works of the company have, of course, been designed and executed with a view to a much larger consumption than has already taken place; and there appears to be no reason to question the correctness of the directors' estimate, that, in twelve months from the present time, the consumption may reach 100,000 cubic feet per 24 hours. It would be impossible for us, in the present stage of its operations, to pass an opinion upon the prospects of this company, especially as we have no personal knowledge of the case; but the *Packet* says that "we may anticipate for the shareholders a larger dividend than that named in the report—namely, 1 per cent. per month!" Moderate this—to our European notions—12 per cent. per annum! but then 20s. per 1000 feet is talked of as a matter of course. It is true that labour and coals are dear, yet the margin of price between 20s. at Buenos Ayres and 4s. in London is very wide. "*Surgit amari aliquid.*" The directors accompany their flattering report by an application for increased capital. This is the usual tale of foreign undertakings in the shape of joint-stock companies; but we are far from saying that the increased outlay may not be required and highly commendable. The present capital is £60,000: it is sought to be increased to £75,000, or by the sum of £15,000. The works of the Buenos Ayres Gas Company were erected by Messrs. Bellhouse, of Manchester, under the immediate superintendence of Mr. Wm. Bragge, as resident engineer; and the directors have paid a very graceful compliment to all the persons who have co-operated in the establishment of this great stride towards the material civilisation of this beautiful country.

Price Current.

CASTINGS, per Ton.

Average Weight of Cast-Iron Gas-Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	4 15 0	3 15 0	3 15 0	4 0 0	4 0 0
1½ and 2 inches Socket Pipes	8 0 0	7 5 0	7 10 0	7 15 0	7 10 0
2½ and 3 „ „ „	7 10 0	7 0 0	7 5 0	7 10 0	7 5 0
4 and 5 „ „ „	7 10 0	6 15 0	7 0 0	7 5 0	7 0 0
6 in. & upwards „ „	7 5 0	6 10 0	6 10 0	7 0 0	6 10 0
Retorts, 1st fusion, hot blast	7 0 0	...	7 0 0	7 5 0	7 0 0
„ 2nd „ cold „	8 0 0	...	7 5 0	7 10 0	7 5 0
Tank Plates, ¼ thick and above	7 10 0	6 15 0	7 0 0	7 5 0	7 0 0

COALS.

NEWCASTLE. Unscreened.	s.	d.		SCOTCH CANNEL.	per ton.
Whitwell Primrose	7	0	per ton	Boghead, at Leith	38s. 0d.
Pelton and Medomsley	7	6	„	Kirkness, best	23 0
Pelaw	7	9	„	Capeldrae, 1st quality	20 0
Burnhope, Eighton Moor, New Pelton, Peareth, South Pelaw, Washington Hutton, and South Peareth	8	0	„	„ 2nd „	12 6
Ramsay's Newcastle Cannel	13	0	„	Lesmahago, at Glasgow	25 0
				„ „ Leith	27 6
				Arniston	22 0
				Wemyss	20 0
				Knightswood	18 0
				Methill	13 0

SUNDRIES.

Best Newcastle fire-bricks	60s. per 1000.	Welch bar iron, in London	£9 per ton.
„ „ clay	12s. per ton.	Foreign spelter	£28 „
Cliff's fire-bricks at Wortley,	57s. 6d. p. 1000	English block tin	£138 „
Tough cake copper	£107. 10s. per ton.	Banca „ „	£140 „
English pig lead	£23 „	Tarred rope yarn	18s. per cwt.

WROUGHT-IRON TUBING, subject to 35 per cent. Discount.

	2 inches.	1½ inch.	1¼ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 2 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
„ „ „ 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows—wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
„ with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	

FREIGHTS, per Ton.

Coastwise—Newcastle.		*Foreign.*	
Chatham & Roches-	8s. 0d	Boulogne	10s. 0d
Cork [ter	11 0	Barcelona	29 6
Dover	8 6	Bordeaux	21 0
Dublin	10 6	Cadiz	21 6
Exeter Quay	12 0	Calais	10 0
Folkestone	8 9	Dieppe	12 3
Hastings	10 0	Genoa	30 0
London [mouth	8 3	Hamburg	13 6
Lowestoft & Yar-	5 9	Havre	12 6
Lynn	5 9	Leghorn	24 0
Portsmouth	10 0	Lisbon	23 0
Plymouth	11 3	Rotterdam	11 9
Whitstable	8 0	Stettin	12 6
Weymouth	9 6	Trieste & Venice	33 0

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„	14 in. by 12 in.	8	2½	2 4 0	5 6
„	16 in. by 13 in.	8	2½	2 10 0	6 3
„	18 in. by 14 in.	8	2½	2 16 0	7 0
„	19 in. by 13 in.	8	2½	2 16 0	7 0
„	20 in. by 14 in.	9	3½	3 7 6	7 6
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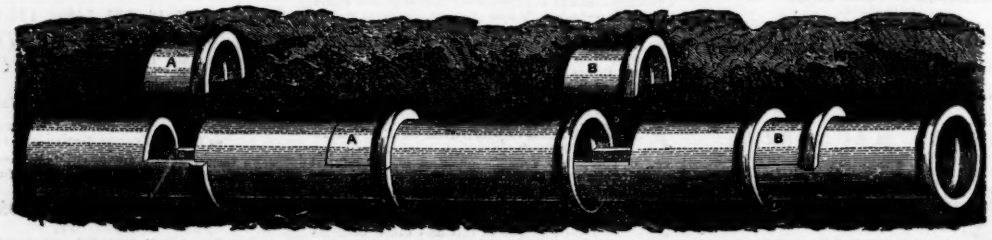

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